

COMPUTERWORLD

Cashing in on Windows NT

Citibank standardizes in bid to regain cost control

By Thomas Hoffman

Citibank has embarked on an ambitious world-wide desktop-to-LAN standardization effort that should save the nation's largest bank millions of dollars over the next several years.

Dubbed Project Enterprise, the program includes the bank's plans to roll out 60,000 Windows NT-based PCs and workstations across its business units in 93 countries.

The NT systems will replace a hodgepodge of older PCs, Unix workstations, Macintoshes and OS/2 machines.

Maintaining and supporting a medley of desktop and LAN systems "wasn't the smartest use of the bank's money," said Ranjit Singh, vice president of LANs and distributed systems at Citibank. "Few people in the bank knew what the true cost of supporting this environment was, so we needed to put things under control."

Before it launched the initiative last year, Citibank had been supporting at least five LAN operating systems for 2,000 worldwide LANs. Novell, Inc.'s NetWare eventually won as the standard.

In addition, the bank was supporting a multitude of desktop software applications from She-

Citibank cashes in, page 99

Fast times at Cabletron		
New switches		
Product	FastNet 10	FastNet 100
Description	Two Fast Ethernet uplinks (fiber or twisted-pair wire), 24 switched Ethernet ports	Eight or 16 Fast Ethernet ports (fiber or twisted-pair wire)
Availability	In 90 days	In 90 days
Price	\$500 per port	\$1,000 per port

Fast track

Cabletron preps Fast Ethernet product blitz

By Bob Wallace

Cabletron Systems, Inc. this week will enter the Fast Ethernet market with products that give users 10 times the bandwidth of existing Ethernet at about 1 1/2 times the cost, *Computerworld* has learned.

Coming this week are two Fast Ethernet lines: the FastNet family, which is based on products acquired in the buyout of Standard Microsystems Corp.'s switching division, and the SmartSwitch line, which is based on internally developed technology.

The vendor will provide Fast Ethernet wares that can handle the continued increase of data traffic from the desktop, workgroup and enterprise backbone network better

than shared-capacity 10M bit/sec. Ethernet. Fast Ethernet is a standards-based approach to boosting Ethernet by an order of magnitude, to 100M bit/sec.

Cabletron had bypassed the Fast Ethernet market, claiming its resources were better spent on ATM technology and products. But this month, the vendor did an about-face and bought the SMC unit for its Fast Ethernet products. That unit also makes Ethernet switches.

Officials at Rochester, N.H.-based Cabletron confirmed plans for an announcement this week but declined to comment further.

"Users want the 100 megabits that Fast Ethernet offers because the

Cabletron, page 99

Postal Service plugging in to on-line potential

By Gary H. Anthes
WASHINGTON

To many, the mission of the U.S. Postal Service is simply this: to deliver the mail through snow, sleet, rain, heat or gloom of night.

But the 200-year-old organization, which still carries mail to the bottom of the Grand Canyon by mule, has decided it is time to move into the 21st century. It is readying several new digital services, including certified electronic mail, electronic shopping kiosks and a hybrid service that marries E-mail and paper mail.

The agency said it needs these services to survive and prosper because electronic competitors are rapidly eroding its market share (see chart).

"New communications technologies offer information consumers opportunities to transform themselves into proactive managers of the information flow," said Robert A. F. Reischer, vice president for technology applications at the Postal Service. "This phenomenon alone will

Postal Service, page 26

INSIDE

- Lotus Notes is attracting a lot of attention these days. See stories about the Lotusphere conference (page 16), training programs (page 59) and third-party tools (page 39).
- Microsoft moves up the ship date for its World Wide Web server, as beta users give it good grades. See story, page 99, by Laura Didio.
- Corporate PC buyers, take heart. Soon you'll be getting more for your money. See story, page 6, by Bob Francis and Mindy Blodgett.
- Oracle is modernizing the mainframe MVS version of its relational database. See story, page 4, by Craig Stedman.

Big Brother, meet Lotus: Feds get encryption keys



Lotus' Ray Ozzie

By Gary H. Anthes
SAN FRANCISCO

Lotus Development Corp. stunned attendees at the RSA Data Security Conference here last week by announcing it had won government approval to export a version of Notes 4.0 that uses encryption 16 million times stronger than export law allows.

But here's the catch: Lotus agreed to give a secret master key to the government. That will make it easier for intelligence and law enforcement agencies to decode files and messages encrypted by the export version of Notes.

Ray Ozzie, the lead developer of Notes, said the agreement with the National Security Agency came after months of negotiation. He called the compromise a "short-term work-around" without saying just what a long-term solution might be.

Also unclear was how users would view the trade-off between tougher security and potential meddling by the government. "It's a creative way

Lotus, page 12

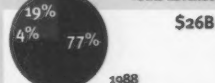
Out with snail mail

The U.S. Postal Service is rapidly losing market share to electronic alternatives

MARKET SHARE FOR MAIL DELIVERY

Postal Service Express delivery services Electronic alternatives

TOTAL REVENUE



Source: U.S. Postal Service, Washington

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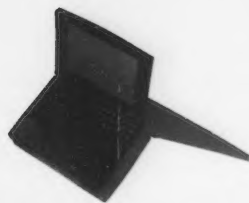
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Users want to bypass the IS staff and cure their own systems problems. That could be hazardous to the health of the business, warns Michael Gentle.

COMPUTERWORLD'S
TechnoTrivia
DO YOU KNOW

What supercomputer is featured in the movie Jurassic Park? The answer is in these pages! Now through May you can play COMPUTERWORLD's game of information retrieval — and turn Trivia into treasure!

See page 46 for "everything you need to know to win!"



Programmers Thomas Duck, David Moore and Kevin Koym (left to right) reveal the agony (you feel dumb) and ecstasy (coding is easier) of learning object-oriented programming.

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Choice Cuts

Intranets are scrambling information systems skills, career paths and possibly head counts. Managing, page 64

Knowledge management demands only a small shift in IS budgets, usually less than 5%, and offers the chief information officer a chance to join the executive huddle. Leadership Series, after page 38



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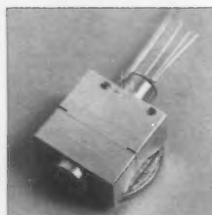
News

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Tipvware



Oticon, a Denmark-based maker of hearing devices, has put what it calls the world's smallest computer inside a digital hearing aid. It allows personalized adjustments to be made via software. The 4-gram DigiFocus runs on a tiny 0.9-V battery and processes 14 MIPS, roughly the same as a 486 PC. A press release said it is like "putting desktop computing power into the ear."



Westinghouse Electric's Science & Technology Center in Pittsburgh has developed a miniature atomic clock for use in high-accuracy timekeeping applications. While it isn't a threat to the cheap, crystal oscillators used in many electronic devices, the miniclock could be cost-effective in fiber-optic and satellite communications networks where precise synchronization is critical.

News to ponder

Detroit will have the first telephone books that include electronic-mail addresses in the business listings, the Knight-Ridder News Service reports.

Toshiba in Japan is marketing a computer-controlled washing machine. It has an LCD panel that tells users how much water is in the tub, which button to press next and how to fix malfunctions, the Kyodo News Service reports.

The New York-based magazine *Blender*, which is distributed via CD-ROM with sound and film clips, is the first multimedia publication to get its Washington correspondent fully accredited by the U.S. Congress' periodical press gallery. The Associated Press reports.

The official vaporware list

The Top 5 announced-but-undelivered products, reprinted with permission from the Dec. 29 issue of "P.C. Letter" in San Mateo, Calif.



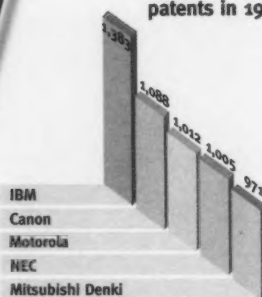
- 4 Apple's OpenDoc; IBM's OpenDoc for Windows
32 months in vapor
- 5 Lotus Communications Server
27 months in vapor
- 6 Apple's Copland operating system and Gershwin operating system
20 months in vapor

- 4 Microsoft Exchange**
16 months in vapor
- 5 Novell's modular messaging environment**
12 months in vapor

■ Send contributions of off-beat news, lists and anecdotes to mbetts@cw.com.

COMPUTERWORLD JANUARY 22, 1996

Companies awarded the most U.S. patents in 1995



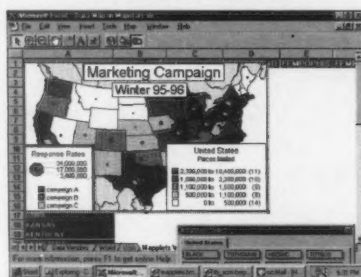
Source: IFV/Plenum Data Corp., Wilmington, N.C.

Human Factors

For centuries, maps have proved useful for navigation and problem-solving. In 1855, for example, a London physician mapped by hand the cases of cholera. He discovered they clustered around a single public water pump and put an end to the epidemic.

Now there is growing proof that computerized maps, also known as geographic information systems, can improve business decision-making and are sometimes superior to tables for visualizing data.

A study by researchers John B. Smelcer and Erran Carmel at American University in Washington found that managers who used computer maps could "eyeball" the solution to certain problems faster than if the data were in tabular format. Maps are well-suited for business tasks such as finding the best retail sites, truck routes and sales territory assignments. Smelcer says. —*Mitch Betts*



Mapping software can help users analyze the results of a marketing campaign

Objectoid of the week

University of Minnesota researchers estimate that 400,000 to 500,000 surgeries are performed each year in the U.S. to treat carpal tunnel syndrome. The economic costs are at least \$2 billion a year. Endoscopic surgery and better monitoring could reduce the costs and incidence rates, they add.

Source: "CTD News," Haverford, Pa.

News shorts

Sears mulls selling its share of Prodigy

Sears, Roebuck last week said it will decide by the end of March whether to sell its 50% share in **Prodigy**. That will end more than six months of uncertainty about whether it will stand by its investment in the on-line service.

Meanwhile, Sears' partner, IBM, is mulling what its future in the service should be. Options include buying out Sears' share, helping in the search for a buyer for Sears' share — or joining Sears in selling out. IBM is considering whether a proprietary on-line service — even an Internet-friendly one such as Prodigy — fits its strategy, said an IBM source who requested anonymity.

The two parent companies have sunk more than \$1 billion into Prodigy, which has been only fleetingly profitable in its 12-year history.

Microsoft buys Vermeer

Microsoft attempted to plug a gaping hole in its Internet development tools lineup with the acquisition last week of tiny, innovative **Vermeer Technologies**. Vermeer makes FrontPage, a Windows-based application development kit that lets end users build Web sites. Prior to the estimated \$130 million deal, Microsoft didn't have any tools targeted at building internal or external Web applications, observers said.

Chase CIO logs off

Craig Goldman, the highly visible CIO at Chase Manhattan Bank, has decid-



Craig Goldman

Goldman, 52, told *Computerworld* that he will retire, effective March 1, for "myself and my family" and not as the result of Chase's impending merger with **Chemical Bank.**

Chemical executives "did a full-court press to keep me here," he claimed.

Spyglass unveils kit to build Web applications

Spyglass last week introduced a software developer's kit intended to help third-party developers build Web applications to run on Spyglass' Web server. With a base price of \$75,000, the kit includes a Web server and several application programming interfaces. Free evaluation copies can be downloaded from <http://www.spyglass.com>.

More shorts, page 8

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Borland victory leaves a murky wake

By Frank Hayes

Borland International, Inc. has won the battle — but maybe the war was already over, said some legal experts after the U.S. Supreme Court affirmed Borland's victory in its five-year "look-and-feel" fight with Lotus Development Corp.

The high court's 4-4 vote last week let stand an appeals court ruling that Borland's Quattro spreadsheet didn't infringe on the copyrights of rival Lotus 1-2-3.

Yet that decision won't provide the formal nationwide guidelines some legal experts were hoping for on the question of which parts of a software application can be imitated by competitors. Because the Supreme Court was deadlocked, the ruling will be binding only in the 1st Circuit, where the case was originally filed.

So this final ruling is likely to mean lit-



"There's times in life you need to take a stand, no matter what the cost is, and we took a stand — but it almost put the company under."

— Borland founder and CEO of Starfish Software, Inc. Philippe Kahn

tle change for users, legal analysts said. The Supreme Court's quick action suggests that issues of software similarity will be hashed out in the appeals courts, which are inclined to allow competitors to create compatible applications but not to copy software directly.

"Sometimes the [Supreme Court] lets the law develop a little bit more and lets things get ripier. If there's a conflict after that, the court will resolve the con-

flict eventually," said Pamela Samuelson, a visiting professor at Cornell Law School.

Released in 1987, Borland's Quattro — and later Quattro Pro, released in 1989 — included the ability to mimic Lotus 1-2-3 commands. Lotus had already racked up legal victories over the makers of other 1-2-3 clones — including Paperback Software, Inc. in Berkeley, Calif., and SCO, Inc. in Santa Cruz, Calif. — before suing Borland in 1990 for copyright infringement. U.S. District Court Judge Robert Keeton ruled in 1993 that Borland had indeed infringed Lotus' copyrights by copying 1-2-3's command structure.

Borland, which analysts feared would be slapped with debilitating damages of \$100 million or more, appealed to the 1st Circuit Court of Appeals, which overturned the decision and cleared Borland of wrongdoing.

The appeals court said basic command sequences, such as the keystrokes required to load a file or copy a spreadsheet cell in Lotus 1-2-3, are functional operations not protected by copy-

right. Technically, that decision now dictates the law only in the 1st Circuit, which comprises New Hampshire, Maine, Rhode Island, Puerto Rico and Massachusetts, where Lotus filed its suit.

"Everybody would have been happier if [the Supreme Court had] come out with a decision one way or another," said Lee Hagelshaw, an intellectual property attorney at Hagelshaw and Cole in San Francisco. "But since they didn't, the uncertainty continues over how far the courts will go to protect user interface. It's a big gray area."

Nonetheless, the case is having an impact. Already, other appeals courts are citing the Borland decision, said Eben Moglen, professor of law and legal history at Columbia Law School.

"The industry might prefer the 1st Circuit's solution broadly and uniformly applied to another six or seven years of legal uncertainty until the Supreme Court can be forced to decide the question," he said.

In fact, that direction is being taken by courts in the 9th Circuit, which covers both Silicon Valley and Microsoft Corp.'s home turf in Washington state, and in the 2nd Circuit, which includes New York, legal analysts said.

The decisions also leave no doubt about more basic issues of copyright infringement. Actual copying of computer code remains clearly illegal, Hagelshaw said.

And even in the gray areas of commands and user interfaces, the era of high-profile lawsuits seems to be over.

Legal calendar

NOVEMBER 1987	Borland ships Quattro spreadsheet with Lotus command emulation
JULY 1990	Lotus files copyright infringement suit against Borland
AUGUST 1993	Trial court bans Lotus emulation in Quattro product line
MARCH 1994	Borland sells Quattro product line to Novell
MARCH 1995	Appeals court reverses trial decision
JANUARY 1996	U.S. Supreme Court upholds appeals court on a 4-4 vote

Oracle7 revives for MVS

By Craig Stedman

Oracle Corp. plans next month to modernize the mainframe version of Oracle7 in a bid to keep the database from disappearing off data center radar screens, sources close to the company said.

Oracle7 for MVS is being infused with support for IBM's new air-cooled System/390s and its parallel sysplex mainframe clusters, the sources said. The sysplex technology lets up to 32 System/390 machines act as a single mainframe with shared data and application workloads.

Users of the Oracle database will be able to cut hardware and maintenance costs by switching from traditional mainframes to the air-cooled System/390s, which are based on CMOS microprocessors.

The addition of an MVS version

of Oracle's Parallel Server Option will allow individual queries to be split across multiple processors in a sysplex environment.

The Oracle software has mostly been a pushover for IBM's own DB2 relational database in mainframe shops (see chart). But Oracle7 for MVS is expected to get an increased marketing push once the new features ship.

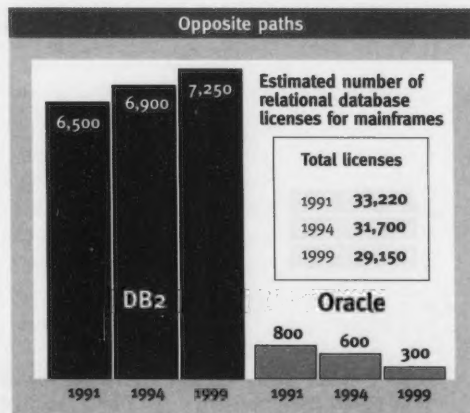
However, mainframe Oracle still faces doubts about its performance. While Oracle and loyal customers claim Oracle7 for MVS is much faster than admittedly slow earlier versions, analysts said it still usually has to take a backseat to DB2.

On a stand-alone basis, throughput on CMOS-based big iron generally will be similar to what Oracle7 users are seeing now, the sources said. But sysplex customers who change their ap-

plications so multiple processors can gang up on queries should see improvements.

Great West Life Assurance Co. in Englewood, Colo., gave up on mainframe Oracle two years ago because of its performance shortcomings. Great West wanted to put Oracle on all its platforms, "but basically we walked away from it" at the System/390 level, said Jens Pedersen, vice president of information technology. A second chance "doesn't seem likely at this point," he said.

But a longtime user of Oracle for MVS in the Midwest said its speed has improved enough to enable his company to pump 2 million transactions a week through the database. The new Oracle7 release should be useful "if it in fact drives the price down without a loss of processing power," said the user, who asked



Source: Gartner Group, Inc., Stamford, Conn.

to remain anonymous.

Oracle must prove that its sysplex support is more than show, said Carl Greiner, an analyst at Meta Group, Inc. in Stamford, Conn. "The question is whether

this is a serious port or not. The darned thing better perform."

Despite the rivalry with DB2, Oracle got development help from IBM's System/390 division. Neither would comment.

Oracle7 Parallel Server: Still Unparalleled.

Key Features

Oracle7

Sybase
~~System 10~~ **SQL Server 11**

Parallel Processing Strategy	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Parallel Processing Slideshow	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fault Tolerant Parallel Server	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Parallel Query Software	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Parallel Index Software	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Parallel Recovery Software	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Platforms Supported with Above Parallel Features	20+	None

Sybase may have changed the name of their database, but they didn't change its "parallel nothing" architecture. Oracle7's parallel everything database architecture makes open system computers faster and more reliable than mainframes. Call Oracle for the software, 1-800-633-1071, ext. 8110. Call Sybase for the slideshow, but please, call one at a time.

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News

PC sales hang tough despite Intel dive...

Pentium-powered systems still hot commodity for users

By Bob Francis and Mindy Blodgett

Intel Corp. took it on the chin from Wall Street last week, but corporate buyers took it with a smile.

That is because PC prices are expected to remain stable while performance increases — all good news for users.

When Intel's robust, but relatively flat, earnings didn't pass muster with stock analysts, the stock fell 10.3% because some investors feared a slowdown in PC sales.

Trading was so fierce that it broke the single-day trading record on the Nasdaq Stock Exchange. The exchange eventually stopped trading in the Santa Clara, Calif., company's stock for the day.

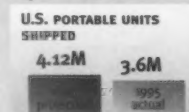
Most analysts downplayed fears of a PC sales slowdown. For one thing, PC sales remained strong throughout the year, up 22% over 1994, according to International Data Corp. (IDC), a research firm in Framingham, Mass. PC shipments reached 22.8 million units in 1995, up from 18.7 million in 1994.

Analysts also cited the move to high-end Pentium-powered systems, which is continuing unabated,

While desktop PC shipments continue to increase...



... portable shipments are falling below expectations



Source: International Data Corp., Framingham, Mass.

ed, fueled by the needs of 32-bit operating systems, the Internet and high-end applications.

"If you've got customers... and they're not buying your low-end systems because they want the higher-end systems, I don't call

that a slowdown because the demand is still there," said James Poyner, an analyst at Oppenheimer & Co., a New York brokerage.

Corporate PC purchasers remain committed to shelling out for systems that can assuage the hunger of power users [CW, Dec. 11]. Associated Grocers, Inc. in Seattle has standardized on Pentium systems, said Thomas Balzani, an enterprise network manager at the company. "We're getting a lot more bang for our buck, more performance and more usable lifespan" as a result, he said.

At *The Los Angeles Times*, Bart Everett, a deputy systems editor, said the company remains committed to its buying plans as it moves many users to Windows 95. "We need some things right now, and prices are low" on desktop PCs, he said.

Despite the record shipments, analysts did see some softness in two areas: domestic consumer desktops and notebooks. According to Poyner, domestic consumer PC sales weren't as strong as some had predicted, particularly for low-end Pentium models. "Apparently, people really wanted the higher-end 100-MHz and 120-MHz Pentiums," he said. Intel and

... but DRAM prices drop

Corporate buyers and systems vendors expected to encounter memory shortages as they moved to higher-priced, 16-bit and extended data output (EDO) and error correcting code (ECC) memory. But they are finding just the opposite is true — prices are dropping.

"We've seen more movement in the DRAM market in the last three months than we've seen in the last three years," said Mike Feibus, an analyst at Mercury Research, Inc. Prices have fallen as much as 20% in that time, he said. For example, the cost of 4M bytes of dynamic RAM has fallen from about \$180 in the third quarter last year to below \$150 now, analysts said.

Lower DRAM prices and component costs may help keep the price of even higher-end PCs low during the next year, several analysts said.

Mike Frost, president and CEO of TechWorks, Inc., a memory supplier in Austin, Texas, said DRAM prices began dropping in November and kept falling through the end of last year. "It's leveled off a bit now, but it may drop for a while yet. There's plenty of supply."

Frost said the falling prices are partly due to the move to higher-end memory for servers, which often use ECC memory, and high-end graphics and multimedia systems, which make use of EDO memory. — Bob Francis

many PC vendors were caught off-guard by the demand for faster chips, he said.

On the notebook side, the story was the same: Users wanted new higher-end systems with CD-ROM drives, reved-up Pentium processors and larger — and now cheaper — screens. But those

systems were harder to get than even high-end desktops.

"The second half of the year just fell apart in the notebook market," said Randal Giusto, a notebook analyst at IDC. "Users want the CD-ROM drives, the Pentiums and the 10.4-in. screens, not the older models."

HP pitches low-end entry as 'net, Web server

By Michael Goldberg

Hewlett-Packard Co. is unveiling a low-end entry model in its HP 9000 computer family this week. The price was designed to compete with familiar Unix rivals and popular Windows NT servers from Compaq Computer Corp.

The introduction of the D class of HP 9000 servers also signals a new push by HP to market its computers as Internet and World Wide Web servers. On Jan. 29, the Palo Alto, Calif.-based company is slated to introduce Web-friendly features for the D class, which includes packaging it with Netscape Communications Corp.'s Commerce Server.

Greg Cline, an analyst at Business Research Group in Newton,

Mass., said the Web server announcement means HP is finally jumping into the Internet game with both feet — and into high-performance machines. "It could be argued that HP was caught with its pants down. Its initial Internet strategy was competition by necessity. Now I think HP is getting on the ball," he said.

Ready and willing

With promised processor and memory storage upgrades, Hewlett-Packard is positioning its HP 9000 D class models as ripe for multimedia applications that require lots of bandwidth, said Jean S. Bozman, an analyst at IDC.

Help apparent

Running on faster processors and a fresher release of the HP-UX operating system, the D class is expected to succeed the aging E class of uniprocessor workgroup and departmental servers, analysts said.

The D models run on HP-UX Version 10.0 and can scale up to a two-processor version using PA-RISC 7100LC or 7200 processors.

Stepping into the ring

HP 9000 D class servers feature the following:

PROCESSOR	PA-RISC 7100 LC or 7200
NUMBER OF PROCESSORS	One or two
MEMORY	2M bytes to 768M bytes
I/O SLOTS	Five or eight
PRICE	\$8,050 for one processor, \$27,590 for two processors

Users praised the performance of the new box.

Paul Gray, director of information systems operations at PC Service Source, Inc. in Dallas, said his PC parts supply firm uses a two-processor D class computer as an Internet server. It replaced a Compaq system that used SCO, Inc.'s SCO Unix operating system and Intel Corp. Pentium processors. "It cut 3½ hours out of one process," a catalog pricing update, he said.

Gray said the tight coupling of HP's hardware and operating system gives the HP 9000 better performance than he could expect to get on a Windows NT system. "Unix is just vastly more robust. [With] NT, there's not the speed or the multiprocessing," he said.

Jean S. Bozman, an analyst at International Data Corp. (IDC) in Mountain View, Calif., said the D class marks HP's entry into a niche where low-end Unix computers — from vendors such as


IBM and Sun Microsystems, Inc. — start bumping into high-end Windows NT servers from Compaq.

The D class servers start at \$8,050 for a uniprocessor model. Similar Compaq ProLiant uniprocessor servers range from \$6,000 to \$13,000.

"They're trying to position themselves to compete with the Compaqs of this world," agreed Bill Moran, an analyst at D. H. Brown & Associates, Inc. in Port Chester, N.Y.

At Washington and Lee University in Lexington, Va., an average of 75 computer science students simultaneously write programs and access applications from a D class server, which replaced an HP workstation.

"The effect on performance has been electric," said John Stuckey, director of university computing.

 **HP paints a picture for HP 500 users.** See page 37.



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CD-ROM flips floppy as software delivery choice

Vendor costs are lower, but retail prices remain the same

By Stuart J. Johnston
and Lisa Picarille

Microsoft Corp.'s layoffs last week of 120 employees at its floppy disk manufacturing facility may signal a long-predicted shift toward putting software on CD-ROM.

Microsoft in Redmond, Wash., said employees were laid off because more and more customers are purchasing products on CD-ROM instead of floppy disk.

In fact, according to some software vendors, users, resellers and analysts, that trend is accelerating.

"The growth of the CD-ROM as a delivery medium has just proceeded explosively," said Jeff Tarter, editor of "Softletter," an industry newsletter in Watertown, Mass. "Three-fourths of the software units sold now are on CD-ROM," he said.

Among the reasons cited by users and resellers are speed, convenience and the permanence of

CDs compared with floppy disks. "We've been getting [software on] CD-ROMs and deploying it from the [network] server," said Brian Moura, assistant city manager for the city of San Carlos, Calif. The city mostly gets site licenses now because most users are willing to dispense with printed manuals, Moura said.

"I can provide better service to a client because [installing software from a CD-ROM] is faster. And, since I'm not swapping floppy disks every two or three minutes, I can do something else useful with that time," said Larry Clary, a systems engineer at Coorens Communications, Inc., a value-added reseller in Chicago.

Better quality

CD-ROMs also tend to be of higher quality, so Clary doesn't have to replace damaged media as frequently as he does with floppy disks. And CD-ROMs are read-only, so they can't get infected by viruses when they are passed

among users, Clary said.

"Our customers are definitely going toward CD-ROM," said a spokeswoman for the Seattle division of Adobe Systems, Inc.

Many business programs take a dozen or more floppy disks, and Adobe's Persuasion presentation graphics program is available only on CD-ROM, she said.

Lower costs

For vendors, it is preferable to ship products only on CD-ROM because they are significantly less expensive to manufacture than floppy disks.

The vendors' costs also are lowered if the vendor doesn't have to ship two different packages — one with floppy disks and the other with a CD-ROM.

But this hasn't always led directly to lower prices for users; so far, vendors have charged similar prices for the two types of products.

In some cases, however, vendors include more code or information on the CD-ROM because it has extra space available.

Most new PCs come with CD-ROM drives, which has added momentum to the trend.

Currently, CD-ROMs account for about 25% of all business soft-

ware sales, but that figure has tripled in the past year, Tarter said. Not having hundreds of boxes of floppy disks to store, inventory

and keep away from stray electrical fields makes it much easier for administrators by saving them time and space, Moura said.

Skip the CD-ROM, go electronic

The need for quick delivery of software to the desktop already has led some users to demand electronic distribution of software.

"Right now, software delivery on the Internet is spit in a bucket," said Jeff Tarter, editor of "Softletter," an industry newsletter in Watertown, Mass. "It's still a niche because modern software products are so huge that the download process is ridiculous, especially when the process often fails."

Still, a few small companies are selling software over the Internet.

Online Interactive, Inc. recently opened its AtOnce software store on the Internet. The company offers 35 Microsoft Corp. products on its World Wide Web page.

Tim Choate, president of Online Interactive in Seattle,

said he expects AtOnce to appeal to corporate users who have high-speed, dedicated lines, such as T1 service. Over a T1 line, a copy of Microsoft's Office 95 could be downloaded in 10 or 15 minutes, he said.

Several users said they can anticipate situations where they might use an on-line distribution service — for instance, if a user needs software immediately or to purchase an evaluation copy.

"I like the idea of getting [software] quickly, [but] I would have to change my thinking quite a bit to give up having a [master] disk," said Briscoe Stephens, coordinator of space sciences in the Advanced Scientific Information Systems group at the National Aeronautics and Space Administration in Huntsville, Ala.

— Stuart J. Johnston
and Lisa Picarille

Delivery media

CD-ROMS rising

In 1994, 30% of retail software sales were on CD-ROM. In 1995, that figure jumped to 60%, according to Jeff Tarter, editor of "Softletter."

News Shorts

Compaq, Intel cross-license

Their apparent feud over, Compaq Computer Corp. and Intel Corp. have signed a 10-year cross-licensing patent agreement. The Houston-based PC manufacturer also has agreed to rejoin the Santa Clara, Calif.-based chip manufacturer's "Intel Inside" marketing campaign.

Oracle goes Lite

Oracle Corp. has announced Personal Oracle Lite, a simplified, single-user implementation of the Oracle7 relational database management system. The newest version of Oracle7 requires less than 1M byte of memory and 10M bytes of hard disk space. It costs \$195 per user. It is set to ship this month for Microsoft Corp.'s Windows 3.1, Windows 95 and Windows NT. A Macintosh version of Oracle Lite is due by spring.

IBM mobilizes middleware

IBM plans by the middle of the year to begin delivering on a promise to enable mobile users to connect into home-office applications via its MQSeries messaging middleware. Wireless links and improved dial-up capabilities will be added to the

OS/2 and AIX versions of MQSeries in the second quarter, said Steve Craggs, business manager for MQSeries at IBM. A beefed-up Windows 3.1 release that can handle mobile users also is due then, but it won't get wireless support until the third quarter.

Safer Internet commerce for Netscape users

Netscape Communications Corp. has signed a deal to bundle its Commerce and Merchant World Wide Web servers with forthcoming secure transaction software and services from Verifone, Inc. The Redwood City, Calif., company plans to target banks, credit-card processing companies and other financial firms that process transactions conducted by on-line retailers. Verifone's products are due in the second and third quarters this year. Prices will be determined on a case-by-case basis.

Documentum protects master versions

Documentum, Inc. this week will announce Document Link for Notes at Lotusphere. The document management software provides a secure repository for master versions of Notes documents, and work-in-process documents reside in the Notes database. The Pleasanton, Calif., firm will ship the software in April (see related story, page 16).

Microsoft, Wang release imaging product

Microsoft and Wang Laboratories, Inc. last week announced the first fruits of the imaging agreement they made last April, releasing imaging software for Windows 95. The software will allow users to scan, view and annotate paper documents and electronic images. It is available free over the Internet and other on-line services. It will be incorporated in future versions of Windows.

Tandem earnings in single digits

Despite a \$22.1 million operating loss for its first fiscal quarter, Tandem Computers, Inc. netted a \$2 million profit, due to the sale of an investment in Network,

Inc. Tandem blamed its loss on declining U.S. sales caused by uncertainty about the company's leadership. The company two weeks ago named Roel Pieper to succeed James Treybig as CEO.

FTP acquires NetWare connection

FTP Software, Inc. in Andover, Mass., said it will pay \$80 million to \$100 million in stock to acquire Firefox Communications, Inc. in San Jose, Calif. The deal, which is expected to close in April, will add Firefox's NetWare-to-Internet gateway products to FTP's line of Windows-based Internet applications and development tools.

Technology cure-all

Roy Camblin, chief information officer at Oracle Corp., last week left the database giant to join Citicorp in Reston, Va. He will oversee global investment management systems at the banking firm. Camblin is returning to the banking field after a 2½-year stint at Oracle. Before he joined Oracle, Camblin was vice president of information systems at Wells Fargo Bank. Joe Cardenas, Camblin's direct report at Oracle, will lead the IS staff until a permanent replacement is found.





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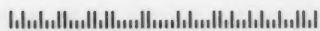
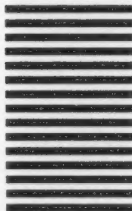
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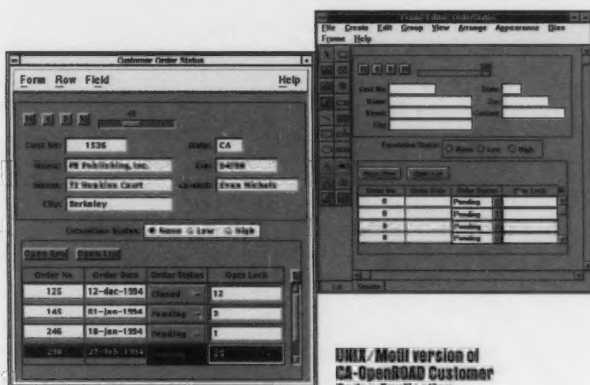
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Catching trouble before it starts

Hewlett-Packard melds network/system management, adds Web reports

By Patrick Dryden

Hewlett-Packard Co. this week will take a significant step toward integrating management tools for the systems and networks

that enable client/server applications.

HP in Palo Alto, Calif., also will introduce its first reporter product to distribute network alerts and performance statistics via the World Wide Web.

Both moves help provide a comprehensive view of complex internetwork components, which in turn helps information systems departments maintain performance according to their service-level

agreements with users. Agent software and monitoring programs from separate HP product groups now can work together on HP's Unix-based OpenView management platform.

"These tools [put us] in a better position to proactively address performance problems instead of users getting frustrated and calling," said Ron Welf, senior technical lead in the network performance and capacity planning group at Charles Schwab & Co. in San Francisco.

New versions of MeasureWare Agent and PerfView Analyzer, which monitor systems and applications, are available and cost \$2,000 per server and \$8,000 per analyzer. Similarly enhanced NetMatrix network diagnostic tools will be released in April: the Internetwork Response Agent will cost \$495 per probe, and Internetwork Response Manager will cost \$3,995.

By sharing data, each set of tools will be able to present combined systems and network performance statistics. Synchronizing data over time from multiple components can alert operations staff to problem conditions before alarms sound or telephones ring.

Network management

One small step

Bringing PerfView and NetMatrix information into a single console is a small but important step for ward, said Brian Burba, network management analyst at International Data Corp. in Framingham, Mass.

"This helps administrators track a problem on both the network and the systems side without hopping between consoles," he said.

Welf said he plans to use NetMatrix to monitor current utilization and gather historical trends on 200 segments of Schwab's network. He is adding the MeasureWare Agent to key servers to track CPU utilization, I/O rates and memory usage.

"From one management station, we'll be able to watch response characteristics at the same time we check network and system utilization," according to Welf. "Then we can more easily correlate all the statistics."

The network has always been easy to blame for slow performance, said Steve Johnson, NetMatrix product manager at HP. "Now the operators can quickly minimize uncertainty about where problems exist, so IS can more efficiently deploy its experts."

The NetMatrix Web Reporter, due in April for \$4,995, can distribute statistics about network performance to anyone equipped with a browser and access to the Internet or a corporate intranet.

This option addresses an important issue in service agreements: how providers can "communicate what they're doing for the users, who are unaware when everything runs right," Burba said. "Instead of sending huge weekly or monthly reports to prove what you're doing, Web access lets users immediately check what's going on behind the scenes."



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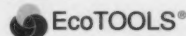
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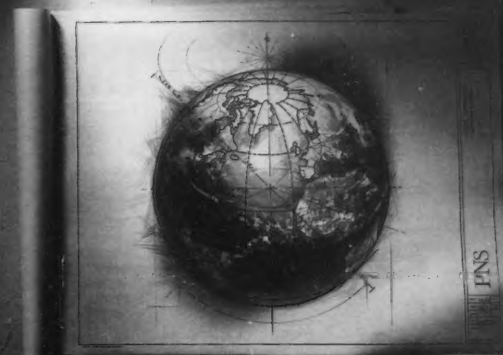


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 Delta's Web site took flight only after a lot of tool talk. See page 53.

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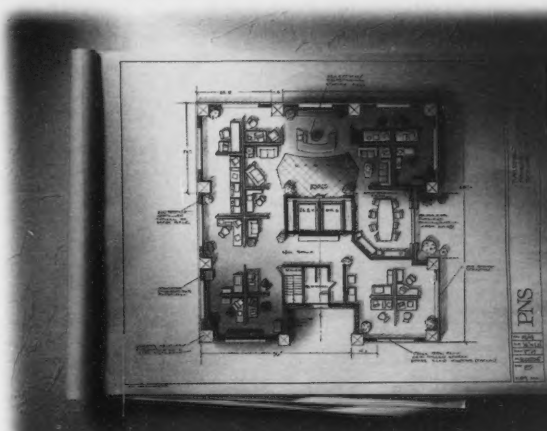
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Lotus keys in on encryption compromise

CONTINUED FROM COVER 1

of addressing export control," said Lynn McNulty, president of McNulty Associates in McLean, Va.

"But it's not clear customers want to be vulnerable to the signals intelligence arm of the U.S. government."

And other software companies certainly aren't rushing to strike the same deal.

Netscape Communications Corp. in Mountain View, Calif., which has had more than its share of bad luck with its cryptography, said it won't follow Lotus' lead.

Still, one computer security specialist at a large financial services company hailed the announcement.

He said his firm will probably upgrade all its foreign offices to the new release of Notes.

Lotus in Cambridge, Mass., now sells a North American version of Notes that uses 64-bit encryption keys, considered by many to be unbreakable by even

the fastest supercomputers.

Until now, the export version used only 40-bit keys, whose encryption has become increasingly easy to break.

In essence, the compromise calls for Lotus to give the government exclusive access to 24 of the key's 64 bits.

Thus, the government will end up with the weak 40-bit keys overseas, while hackers and other rogue forces will be stopped cold by the full 64-bit keys, Ozzie said.

It's a deal

"It's a good compromise and a huge improvement for users overseas," said Dorothy E. Denning, a cryptography expert and computer science professor at Georgetown University in Washington.

But not everyone agreed. Those philosophically opposed to key escrow said Lotus had caved in to government pressure, albeit in a limited way.

The government action may provoke howls of protest from foreign countries as well.

Ozzie joked that he had freed



Cutting our own throats

The U.S. Department of Commerce recently released a report that claims U.S. export controls on encryption products are hurting the nation's competitiveness. In the report, The National Security Agency, which studied encryption software for sale outside the U.S., warns users that much of the software isn't as secure as it claims to be.

up disk space in his voice-mail system to make room for calls from concerned governments.

"I will discuss it with them, but we have no intention of doing something special for other gov-

ernments," said Ozzie, who is also president of Iris Associates in Cambridge, Mass.

The 40-bit keys were considered secure enough until last summer, when a French student cracked a message encrypted by a 40-bit key.

That destroyed the confidence of many business users in the export version of U.S. software and led U.S. companies to complain that the export laws are outmoded and are costing them millions in lost sales (see story below).

No capitulation

Clearly, Lotus doesn't consider the proposed approach a key-escrow scheme and hopes customers won't, either.

"We talked to our overseas customers about [key escrow], and their answer was a clear and resounding 'No,'" Ozzie said.

Yet his position is that because Lotus is providing the government with only part of the key, the company isn't capitulating to the unpopular key-escrow system.

Edward Hart, who retired as

deputy director of the NSA for information systems security a month ago, candidly confessed that the NSA blundered with its enormously controversial "Clipper chip" proposal.

It sought to establish the widespread use of cryptography with the government as key-escrow agent.

Asked if the NSA's insistence on keeping the Clipper encryption algorithm secret added to user resistance, Hart said, "The answer was, 'I'm from the government, trust me.' That's not a good answer."

Vendors secure the perimeter

Ray Ozzie and his Lotus bombshell caught the limelight at last week's RSA Data Security Conference, but other companies also had something to talk about:

• **RSA and IBM** said they will develop interoperable security across IBM's product line and other vendor products that use RSA encryption technology. The companies want to facilitate secure commerce on the Internet. The companies will modify RSA's Safe encryption software and IBM's Common Cryptographic Architecture. This will let applications that are developed with RSA's tool kits use IBM's hardware-based cryptography.

• **Nortel, Inc.** announced Entrust 2.0, a new release of its software for encryption and digital signatures. Enhancements include command-line integration with office applications and secure file deletion.

• **Trusted Information Systems, Inc.** in Glenwood, Md., announced an encryption key escrow and recovery system.

• **Premenos Corp.** in Concord, Calif., unveiled Templar 2.0, authentication software for electronic data interchange.

—Gary H. Anthes

Industry groups seek to secure 'cyberproperty'

By Neal Weinberg

Industry groups, armed with a Commerce Department report that backs their arguments, are redoubling their efforts to fight encryption software export restrictions that could cost U.S. companies \$60 billion in lost revenue by the year 2000.

The Business Software Alliance, a staunch opponent of the Clinton administration's policy on encryption, is teaming up with the Alliance to Promote Software Innovation to form a new policy council that unites major hardware and software vendors.

40-bit ceiling

High on the council's agenda is the ongoing battle against a policy that caps the export of encryption software at 40 bits in a world where customers are demanding 56-bit and 64-bit encryption.

The explosion in Internet traffic has moved the issue of data encryption to the front burner, said Robert Holleyman, president of the Business Software Alliance. Before companies will put sensitive data over the Internet or conduct electronic commerce, they want to know that their "cyberproperty" is protected.

These industry groups oppose the Clinton administration's encryption policy

Industry group	Members
Computer Systems Policy Project	CEOs from 13 major hardware companies including Apple, AT&T, Compaq, Digital, Hewlett-Packard, IBM, Silicon Graphics, Sun and Unisys
Alliance to Promote Software Innovation	Major hardware companies including Intel, Apple, IBM and Digital
Business Software Association	Major software companies including Microsoft, Lotus, Novell and Sybase

Current policy could mean "a huge economic loss" for U.S. software companies, Holleyman said. "All it's designed to do in the long run is to lose market share for U.S. software companies."

The U.S. Department of Commerce released a study last week that concluded that "the growth of an international market for encryption software is being slowed by strong export controls."

The report added that more than 300 U.S. companies develop and export cryptographic products.

And another industry group, the Computer Systems Policy Project (CSPP), last week released a study that argued current export controls "severely limit" the ability of U.S. firms to meet customer demand for electronic security. The CSPP estimated the potential lost revenue at \$30 billion to

\$60 billion by the year 2000.

Industry leaders hope their united front and the weight of the two new reports will finally have an impact.

Legal guardian

The Clinton administration, concerned about foreign terrorists gaining access to sophisticated encryption technology, has offered a compromise in

which the government would hold a spare set of code-breaking keys.

But industry groups have rejected this "key escrow." Ken Kay, executive director of the CSPP, said, "There is not a market demand by foreign users for a key-escrow system in which the U.S. government would approve the key holder."

"Clearly, our customers want encryption features in database software," said Michael Engelhardt, vice president of external affairs at Sybase, Inc. in Emeryville, Calif.

He said the company is trying to figure out a way to meet customer demand and still comply with the export controls.

The CSPP wants the government to lift export controls on U.S. companies but prohibit the sale of cryptographic products to terrorist countries.



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Suite links enterprise, Web site

On-line vendors gain ability to manage inventory

By Mitch Wagner

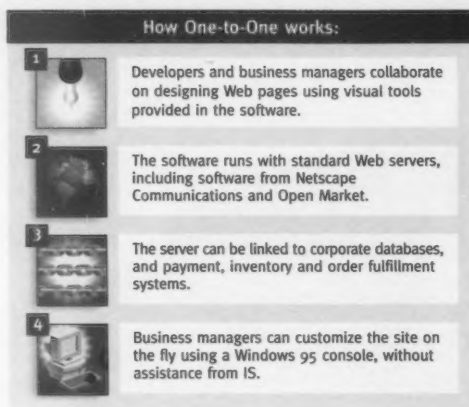
A start-up company plans to announce today a software suite that will help big businesses conduct electronic commerce on the Internet by integrating World Wide Web sites with enterprise applications.

BroadVision, Inc.'s One-to-One was designed to let Web software work with mainstream corporate information systems the same way other point-of-sale or customer-service applications do, said Bob Runge, vice president of marketing at BroadVision in Los Altos, Calif.

With One-to-One, the Web site could present different information to different visitors, depending on their interests and needs. The package includes a tool set that would let IS staff build Web applications that could be run by non-IS personnel, including marketing executives and business managers.

One-to-One was designed to manage content on a Web site by linking the Web interface to a company's systems for product management, inventory management, taxation, shipping and handling, payment processing and order fulfillment.

The product has built-in links to Oracle Corp. and Sybase, Inc. ap-



plications and databases and can connect to any application that uses the Common Object Request Broker Architecture standard, the vendor said.

Users register when they first visit a site, and the content provider can program a questionnaire that will profile user interests and financial status. The software will track which site pages users visit most often and shows users the information most likely to be of interest to them.

End-user control

The software also includes a control console that runs on Windows 95. The console lets non-technical people, such as business managers and marketing executives, control content on the site.

For instance, a business manager could offer discount prices for services that would be relevant to users who match a particular profile. "He could say, 'Let me generate a 15% discount coupon to all the males west of the Missis-

sippi between 18 and 35 [who] indicate they have an interest in bicycling in the summertime,'" Runge said.

The Virgin Group of Companies, a British conglomerate, plans to use One-to-One to offer travel, entertainment and on-line shopping services via Virgin Net. It will unveil the on-line service later this year, said Alex Dale, deputy managing director of Virgin Net in London. Dale said Virgin likes having the ability to personalize the on-line service for each customer and letting nontechnical users control the content of the company's Web site.

The BroadVision software runs on Sun Microsystems, Inc. SPARC systems, and Hewlett-Packard Co. HP 9000 Models 700 and 800 and IBM RS/6000 servers. It is priced based on usage; a typical contract costs \$95,000 for 5,000 profiled visitors.

Novadigm hits net app needs

By Patrick Dryden

Help is on the way for businesses eager to make client/server applications available internally or to the outside world via the Internet.

Novadigm, Inc. this week plans to introduce a two-phase strategy to enhance its scalable, object-oriented tool for deploying and configuring client/server applications over diverse networks.

The forthcoming components adapt this Enterprise Desktop Manager (EDM) to handle software for browser-equipped clients and World Wide Web servers.

The Novadigm announcement — and previous announcements from Computer Associates International, Inc. and Tivoli Systems, Inc. — herald a push by traditional systems management vendors to support this wild, new Web environment, said Waverly Deutsch, an analyst at Forrester Research, Inc. in Cambridge, Mass.

More promises than products will appear this year, Deutsch said, as vendors "try to help IS managers who traditionally relied on 'sneakernet' software distribution and updates to cope with a world where applets proliferate like bunnies."

The EDM Client for the Intranet will be available this week. It extends EDM's automated control of access, presentation and configuration policies to intranet users. Those who use a browser to check corporate memos, for example, could use EDM to check and synchronize their desktop software.

EDM Adapters, which are software objects that link EDM with other enterprise management tools, will be released later, company officials said.

The adapters will integrate standard Internet tools and processes into EDM's object-modeling environment so corporations can safely present their applications to outside users, according to officials at Novadigm in Mahwah, N.J.

The plot thickens

Sandia National Laboratories was having difficulty distributing and configuring applications among nearly 10,000 desktop systems. So last year, it adopted EDM and plotted a course to a Web-based architecture, said Don Daigle, manager of electronic commerce and desktop systems at Sandia.


"We expect to retain the same control over applications with EDM as we head down the Web path," Daigle said. "Eventually, this policy-based product will [let us] grant access based on individual credentials, so someone at a satellite location can click on our Sandia home page [and] have access to internal applications."

Novadigm's Internet support could solve the monumental task of keeping browsers and attendant helper applications up to date, said Larry Rodda, senior manager for systems and technology at KPMG Peat Marwick.

"A service could dynamically update and reconfigure these tools instead of merely advising users what versions it expects," Rodda said.

And with Novadigm's agent in place, commercial software distribution could go beyond simple file transfers, Rodda said.

"Now it's absolutely possible to deliver, install, configure and make operational software [that is] purchased over the Internet," he said.

 **Delta Air Lines** decides on a Web site. See page 53.

Psst! You wanna buy a Cisco 7500 cheap?

By Bob Wallace

In an innovative move, Cisco Systems, Inc. is offering the legions of 7000 router users a financial incentive to move to its more expensive and far more powerful next-generation 7500 units.

The router market leader's new "investment protection plan" gives users credits of \$4,500 to \$5,000 toward the \$10,000 to \$14,000 in software and hardware costs they will incur when they upgrade to the 7500s. Those routers more efficiently support routing and switching.

"They could be doing this if [the 7500s] aren't selling, if they want to migrate users to the more robust and feature-rich 7500s, or

both," said an industry analyst who requested anonymity.

Cisco's 7000 router line offers 500M bit/sec. of total bandwidth and can process up to 270,000 packets per second. The supercharged 7500 offers four times more bandwidth (2.1G bit/sec.) and close to double the processing power (500,000 packets per second).

Users with 7000 routers applied the program.

"It appears to be a very decent upgrade program, one that we should probably take advantage of," said Bill Horst, chief at the General Services Administration's communications branch in Philadelphia. "Cisco seems to be leading the way. Other vendors

should take notice, as this strategy makes strong sense."

Cisco in San Jose, Calif., claims to have shipped 30,000 Cisco 7000 routers since they became available in 1993.

The interface cards for the 7000s work with the 7500s, but the new interface cards support more ports. The interface cards Cisco designed for the 7500s are much more efficient than the older ones; they use a higher-performance processor and combine previously separate switching and routing functions.

Cisco also will give users a credit of \$3,000 per older interface card toward the purchase of one designed specifically for the 7500. The interface cards for the 7500 cost \$12,000 to \$17,000 each.

Routers

Info highway management

Novadigm will extend its software management tools to configure clients from the Internet or intranets

ACCESS POLICY MANAGEMENT

Callers get access to classes of services based on authorization and licensing

CLIENT CONTENT MANAGEMENT

Autodiscovery tools and synchronization engine automatically determine what data the caller should view and how to get it

VERSION MANAGEMENT

Configuration process updates programs, files, objects and access policies

D&B success drives Oracle pitch to SAP camp

50% discount offered to lure rivals' users to client/server financial apps

By Julia King

Attention, software shoppers!

Buoyed by the positive response to its month-old cut-rate pricing program for Dun & Bradstreet Software customers, Oracle Corp. last week said it is working on similar price breaks for users of SAP AG's mainframe-based R/2 system.

Discounts also would be extended to companies that have bought SAP's R/3 client/server software but are still implementing it.

Client/server software

"As we see it, the longer someone is pulling their hair out trying to implement, the more likely they are to switch," said Zach Nelson, vice president of marketing at Oracle in Redwood Shores, Calif.

D&B Software customers who migrate to Oracle's client/server-based financial applications between now and April 1 will receive a discount equal to 50% of the original purchase price of the software, or 6% times the cost of support fees.

About 20% of the 6,000 or so D&B mainframe software users Oracle has contacted by mail have requested additional information about the discount program, Nelson said.

SAP systems

Of the 1,105 R/3 systems installed at large companies as of Oct. 1, 1995, 805 were up and running, according to SAP executives.

to persuade entrenched SAP users to jump ship.

"At this point, it's just not even conceivable for us," said Mary Kay Devillier, manager of integrated systems at Albemarle Corp., a specialty chemical company in Baton Rouge, La.

Extensive implementation

Devillier said Albemarle has implemented R/3's supply chain management modules throughout its operations in North America and the Far East.

"But the project is not just an implementation of software," Devillier said. "It's a re-engineering process. A large part of the time is spent adapting people to new business processes and training people."

"The timing for discounts in the D&B case is opportune, but as far as discounts for SAP, it's all just marketing noise," said Ed Black, an analyst at Aberdeen Group, Inc. in Boston.

Even some D&B mainframe software customers said a good price alone wouldn't persuade them to switch to Oracle's applications. "Price is not the only thing we look at," said Bob Moloy, financial applications

manager at Bowman Grey Medical Center at Wake Forest University in Winston-Salem, N.C.

"But if the price and functionality together equaled something we needed, we

would look at it," he added.

D&B Software in Atlanta and Oracle estimate that D&B's customer base is about 4,000 companies. A majority run D&B's mainframe-based financials software.

About 1,450 companies run D&B's Advanced Manufacturing and Production System software.

D&B also offers a suite of client/server applications known as SmartStream. These run exclusively on Sybase, Inc. relational databases.

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Users to Lotus: What's up with Notes/Web plans?

By Tim Ouellette
and Suruchi Mohan

Legions of Lotus Development Corp. software users aren't descending on Walt Disney World to see Goofy and Donald Duck.

No, attendees at Lotusphere '96 in Orlando, Fla., this week expect to get more details on the current Notes 4.0 upgrade and its previously announced integration with the World Wide Web [CW, Dec. 18] and other IBM products.

"I am looking forward to hearing about the Internet connections," as none were included in the beta copy, said Roy Rumaner, a Notes developer at Stone Container Corp. in Chicago, which has about 1,000 Notes users.

Third-party concern

Even Lotus third-party developers are interested in more details on the Web plans.

"I would love to hear them embellish it more, give a little more detail. I want to get a good feel for how Lotus views the next 18 months of Internet development," said Eric Peterson, president of the Cambridge Software Group in Cambridge, Mass.

Users also said they want more specifics about how Lotus will add native Hypertext Transport Protocol and Hypertext Markup Language (HTML) support to Notes servers and how Notes will address the differences between the Rich Text Format of Notes documents and the Web's HTML format.

Tired of delays

Other users said they are just a little weary from the delays in shipping the Notes upgrade, which was three weeks late, and the CC:Mail upgrade, which was due Dec. 28 but is still in beta testing.

"If we had a bunch of their new stuff in-house, in hand, we would have at least sent two people to the show," said Thomas Bridges, network administrator at the Internal Revenue Service in Austin, Texas. "I am just hoping to hear something definitive now." His department has moved on to other

projects because the Notes and CC:Mail upgrades were late.

As usual, third-party developers will announce Notes-related products, including the following:

- **Revelation** Software, based in Stamford, Conn., will announce VIP 2.0, an upgrade to the Notes visual programming tool that Revelation bought from Lotus last year. VIP 2.0 will feature native support for Notes

4.0, Windows 95 and Windows NT.

- **Motorola, Inc.'s** Wireless Data Group will unveil software that gives wireless access to Notes servers over several wireless radio networks. Motorola has also extended access to its AirMobile Wireless Software for Lotus' CC:Mail to the Cellular Digital Packet Data networks.

- **Percussion Software** will showcase Netrix Composer 3.1. The Waltham, Mass.-based company

has added a graphical user interface and wizards to make it easier for Notes users to access relational databases.

- **Symantec Corp.** will preview the integration of its personal information manager software ACT

with Notes 4.0 databases.

Senior writer *Mindy Blodgett* contributed to this report.

Notes needs extra care when it comes to training. See page 59.



Go with the flow

Lotus is trying to improve workflow capabilities with Notes Release 4.0. But users might find the results to be a mixed bag.

While Lotus has provided more tools to develop workflow applications, as in Version 3, corporate users will still have to do a lot of programming to set up tasks.

The Notes 4.0 interface provides tools for building simple workflows, but not the ability to design graphical processes. For that, users will still need third parties.

"I'm looking forward to [seeing] if workflow is made easier," said John Schulz, se-

nior project manager for groupware at US West Management Information Services in Denver. "Will it simplify the task or reduce time to do workflow applications?"

Lotus said the magic fix will be LotusScript, an object-oriented procedural programming language that will be embedded in Notes 4.0. LotusScript is supposed to ease programming of Notes applications.

In Release 3, Notes was missing a graphical development environment and a workflow-state engine that monitors full time the status of workflow tasks. — *Suruchi Mohan*

Tech companies take roller coaster ride

By Stewart Deck

As financial results rolled in from around the industry last week, it was like watching the votes come in for a national election. The precincts reported in, and the results were scrutinized for big-picture significance. Some people watched the incumbents to see if any stumbled, while others scanned the tallies for up-and-coming candidates.

"The consistent theme in all of these earnings statements is that companies with exposure to the PC market have had a hard time," said C. B. Lee, an analyst at Han-

cock Institutional Equity Research in San Francisco. "Industry expectations were very high going into the Christmas season, and the consumer demand turned out to be decent, but not spectacular." Companies involved with mainframes, mainframe software, data communications and networking fared much better.

Bad news

The pollsters expected Apple Computer, Inc. would have a rough quarter. When the votes were tallied and the Cupertino, Calif., firm announced its quarterly results, the news was indeed

bleak. For the last quarter of 1995, Apple posted a \$69 million loss, compared with \$188 million in profits for the same period in 1994 (see chart). This despite a 11% rise in Apple's sales, to \$3.15 billion from 1994's \$2.83 billion.

Apple President and CEO Michael Spindler said that in the first phase of its latest restructuring, Apple will cut 1,300 jobs from sales, marketing and administration to reduce expenses.

Another longtime incumbent, Intel Corp., failed to measure up to the market's expectations and paid the price. The Santa Clara, Calif., chip maker posted profits

of \$867 million on sales of \$4.59 billion, an increase over the \$372 million in profits and \$3.23 billion in sales the company posted for the comparable period in 1994.

"Intel got a little taste of how complex the motherboard business can be," Lee said. The taste wasn't a pleasant one (see story page 6).

Conversely, enterprise software, mainframes and data communications vendors cheered up Wall Street with their earnings. Computer Associates International, Inc., fueled by strong international sales and the addition of Legent Corp.'s products, rang up just over \$1 billion in sales for its fiscal third quarter, 39% higher than CA's \$721 million in revenue

for the same quarter in 1994. "They beat my revenue estimate by \$100 million," admitted Chuck Phillips, a software analyst at Morgan Stanley & Co. in New York.

The Islandia, N.Y., software firm's revenue growth was buoyed by a 34% increase in its mainframe software proceeds. CA's CA-Unicenter distributed systems management software added an estimated \$175 million to the bottom line, Phillips said.

Sun Microsystems, Inc. also outran analysts' expectations for the quarter, with profits that rose to \$126 million, an increase of 54% from the previous year's \$81.6 million profits. Sales for the Mountain View, Calif.-based firm

rose to \$1.75 billion, 19% over 1994's posting of \$1.47 billion. Analysts credited the growth to strong sales of network servers, especially for the Internet.

When all the numbers came in from the Armonk, N.Y., precinct, IBM showed a winning quarter. Fourth-quarter 1995 sales were \$21.9 billion, a 10% increase over 1994's \$19.9 billion for the same period. Profits were up, to \$2 billion from \$1.2 billion in the comparable quarter in 1994.

IBM's mainframe shipments rose 80% in the quarter and were up 59% for the year as a whole.

These results show the public that IBM is "functional and growing with acceptable margins," said Roxane Googin, an analyst at Gruntal & Co. in Beverly Hills, Calif. "The industry is moving in IBM's direction. IBM is showing that they have a market, products and an executable plan."

All eyes turned to the West Coast late in the week as results came in from Bill Gates' ward. Microsoft Corp. reported sales of \$2.19 billion in the fiscal quarter, an increase over the \$1.48 billion posted for the same quarter in 1994. Profits were \$575 million, up from \$373 million for the comparable quarter in 1994.

Financial results for calendar fourth-quarter 1995

COMPANY	REVENUE OCTOBER THROUGH DECEMBER	PERCENT CHANGE FROM 1994	PROFIT/LOSS OCTOBER THROUGH DECEMBER	PERCENT CHANGE FROM 1994
Apple	\$3.1B	11%	-\$69M	NM
Computer Associates	\$1B	39%	\$227M	30%
IBM	\$21.9B	10%	\$2B	65%
Intel	\$4.6B	42%	\$86M	133%
Microsoft	\$2.2B	48%	\$570M	54%
Sun Microsystems	\$1.8B	19%	\$126M	54%

NM = Not meaningful

“

This is a highly detailed digital collage centered around themes of technology, media, and global connectivity. The background is a dense field of white binary digits (0s and 1s) on a dark grey surface. Key elements include:

- A realistic globe at the top center.
- A vertical film strip running down the middle-left.
- A computer monitor in the bottom right corner showing a website interface with the word "PROMOTION" visible.
- A small, square-framed portrait of a man's face on the right side.
- A large, stylized camera lens or shutter mechanism near the top right.
- A film reel and another section of film strip in the bottom left.
- Various abstract shapes, including triangles and rectangles, some appearing as if they are floating or attached to the main composition.

The overall aesthetic is futuristic and tech-oriented, blending physical-world objects with digital data representations.

We believe that the merger enhances Informix's long-term position. Informix has gained a 1-2 year lead over Oracle and Sybase and will begin to establish "mindshare" as the "next-generation RDBMS" company.

This is a highly strategic acquisition that appears to now place Informix in the lead ahead of Oracle in supplying database technology to the Internet.

This acquisition positions Informix to take and hold a strong leadership position in the emerging market for advanced DBMS for managing new types of digital information and complex data structures—which has broad applicability in traditional computing environments, but particularly for Internet-based applications.

Informix has made a bet on the Web and multimedia based applications that could redefine the company's role in the industry.

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News

Oracle, users split up over conference

By Dan Richman

Highlighting the schism between Oracle Corp. and some of its customers, Oracle's national user group this year will hold its educational conference without the company's cooperation or approval, the

group said last week.

The event, traditionally known as International Oracle User Week (IOUW), is scheduled to convene in Dallas Sept. 15-20. It was originally slated to be held in San Francisco in September as part of an exposition called Oracle Open World. That expo-

sition will now make its U.S. debut Nov. 3-7 in San Francisco as Oracle's single annual educational and marketing event for customers.

Redwood Shores, Calif.-based Oracle will offer no financial support to the user event in Dallas, will send no speakers to partici-

pate and won't exhibit there, said Zack Nelson, Oracle's vice president of marketing.

Oracle attorneys have ordered the International Oracle Users Group-Americas (IOUG-A), a corporation that sponsors IOUW, to cease using the phrase "International Oracle User Week" and the acronym "IOUW," both of which Oracle has trademarked. IOUG-A Chairman Mike Corey said the group plans to fight that order.

Oracle and IOUG-A each blamed the other for the split, which followed two months of intermittent but intense negotiations. "We met every one of their demands, and they still walked away," Nelson said. "What in the world can they be thinking about?"

"We wanted to prevent Oracle's marketing efforts from controlling the show, but all we got was 'No, no, no,'" Corey said.

Many users said they are worried and disappointed by the split.

"IOUW has been one of the foremost education and training events of the year for us, and one of its most important elements has been seeing new products and interacting with Oracle developers and executives," said John Kievit, a product manager at Shell Western Exploration and Production, Inc. in Houston. "We'll have a tough time deciding which show to attend."

Pat Ryan, chairman of Puget Sound Oracle Users' Group in Seattle, said, "Alienating users like this causes a lot of anxiety among users. It also loses the best sales force Oracle could have: the users."

Vendors, too, are perturbed.

"I don't like being forced to choose between the two shows or having to show at two places with twice the expense and twice the hassle," said Cameron Jenkins, director of marketing at Acucobol, Inc. in San Diego, an Oracle business partner. "But in the final analysis, the smart money has to be with exhibiting at Oracle's show, since Oracle says it's going to put \$10 million into it."

Some good may result

If the split proves to be irreconcilable, it may not be entirely bad. Oracle is tapping the heads of regional user groups to replace IOUG-A members in coordinating educational sessions at Oracle Open World. That will bring fresh talent, attitudes and opinions into play.

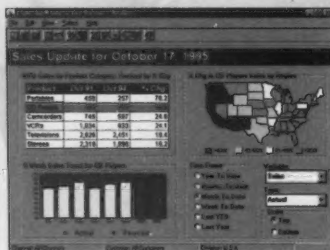
"Yes, the split is regrettable, but I have never felt IOUG-A represented me or was very responsive to the issues or to my needs," said Dale Lowery, president of CaseTech, Inc., a Washington database consultancy. He is also chairman of Oracle User Resource, a group of East Coast Oracle developers.

"Maybe the changes will lead to a net improvement," he said.

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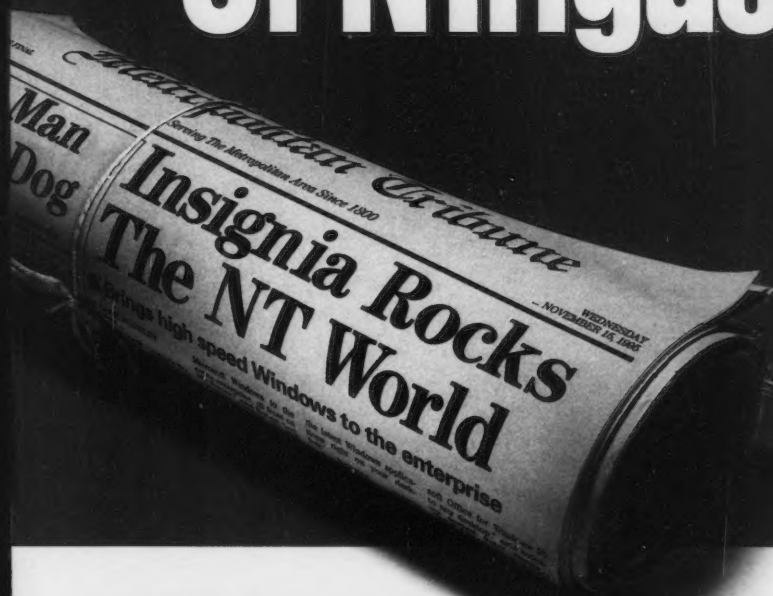
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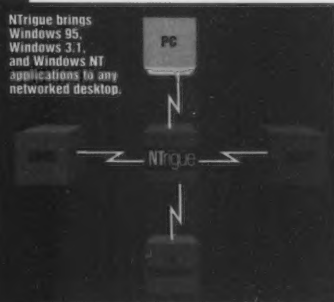
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Copland slated for multiphase beta test

'96 ship 'feasible' for Apple's operating system

By Lisa Picarille

Apple Computer, Inc. is adjusting its beta-testing schedule to ensure that its next-generation operating system gets into us-

ers' hands by the end of the year.

Apple officials won't commit to a specific release date for Copland, but they recently called delivery of the product this year "completely feasible."

When Apple officials announced Copland last May, they said the Mac OS with the completely new architecture would be available by mid-1996.

It originally was promised with a feature set that would have included a micro-kernel, customizable interface, revamped

finder for file management and OpenDoc support. Last summer, the Cupertino, Calif., computer company suddenly refused to discuss a delivery schedule, except to insist mysteriously that Copland somehow was still on schedule.

Meanwhile, several large Macintosh customers, including Lockheed Martin Missile and Space, put off possible migrations to Windows 95 to evaluate Copland, given the promise that the Macintosh operating system would be available this year.

To get Copland out the door by year's end, Apple has changed its beta-testing procedure, according to Vito Salvaggio, group product manager for Copland.

Instead of waiting for all the features to be ready at the same time and then sending Copland out for beta testing, Apple plans to send out a series of three or four beta "developer releases" of Copland.

Microsoft Corp. used a similar strategy to seed developers with its Windows 95.

Going native

Copland will be 90% native Power Macintosh code.

The developer releases will be missing features, and some of the features that are included may not be complete.

"We just make it clear to developers what works and what doesn't," Salvaggio said. "There is no reason to hold up the whole process waiting for everything to be done."

Apple earlier this month sent a developer release to a handful of tool makers, including Microsoft. Apple will come out with a second release sometime this spring, which it will send to Macintosh application developers. The goal is to make sure that software programs work with Copland.

Salvaggio said the time when Apple will finally freeze the code and ship it as a finished product depends on the amount and type of feedback Apple receives from beta testers.


Not included

Regardless of when it ships, Copland won't use PowerTalk/PowerShare, Apple's proprietary mail and directory services protocols.

In the past several months, Apple has been moving to a more open strategy — "Fit In But Stand Out" is the company motto. And two weeks ago, it shifted its messaging strategy to fit that focus.

Instead of using PowerTalk and PowerShare, Copland's collaborative services will be based on industry standards that include Simple Mail Transfer Protocol, Point of Presence, Multipurpose Internet Mail Extension and OpenDoc.

"This is a good move," said Pieter Hartsook, editor of "Hartsook Letter," an industry newsletter in Alameda, Calif. "Nobody wants a proprietary messaging system. The transition to industry and open standards will make it more widely used."

 **Microsoft adds** Internet tools for the Macintosh. See page 54.

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- (b) Netware (f) Windows NT
- (c) OS/2 (g) Windows
- (d) Unix (h) NextStep
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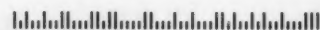
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Postal Service jockeys for electronic future

CONTINUED FROM COVER 1

shake the Postal Service to its core."

But competitors and some postal customers aren't thrilled by the agency's plans.

Critics say the Postal Service should stick to its knitting and let the private sector take the risks and reap the rewards of electronic commerce.

"The Postal Service is a \$55 billion operation. In order to make a difference, the new services have to spawn a couple of Micro-softs," said Michael Cavanagh, president of Cavanagh Associates and a telecommunications and postal policy consultant in Arlington, Va.

Most of the areas they are looking at are highly, highly competitive."

The Postal Service will run pilots of three services this year, each of which it claims could grow to a \$500 million business by 2000. Leading the way is a project to establish the agency as a national "certification authority" — an issuer and manager of tamperproof electronic certificates of identity.

The agency will use public-key cryptography and digital signatures to authenticate — with certificates — users who send E-mail and financial transactions through it via the Internet or commercial networks. It also will affix tamper-

proof postmarks to electronic documents to prove, for example, when a tax return was sent.

Richard L. Rothwell, senior director for technical integration, said the Postal Service will license its technology to major software vendors. "In the future, when you buy CC-Mail, the box will say, 'Postal Electronic Commerce Services-ready.' When you click on an icon, it will invoke options such as electronic postmark, certificate, return receipt and so forth," he said.

The Postal Service this year also will begin rolling out interactive electronic kiosks. The kiosks will allow multimedia on-line shopping tied in to postal customers' billing and shipping systems.

In a third project, the agency will test a "hybrid mail" service. It will, for example, let companies rapidly send E-mail over long distances for local printing and hand delivery to people without E-mail capabilities.

Reisner said the agency hopes that revenue from its ventures will let it postpone postal rate increases, which now come every three years.

No big bucks

But some observers scoff at the notion that the services will make a significant financial contribution.

"The biggest issue is: Is there a market for these services?" said Victor Wheatman, vice president of electronic commerce at Gartner Group, Inc. in Stamford, Conn. "For example, there is no proof [that] there will be enough demand for certification authorities for anyone to make any money at it."

Wheatman also said that entrenched competitors already offer many of these services. "Look in the Yellow Pages under 'mailers,'" he said. "What does the [Postal Service] add?"

Postal Service officials say they will meet the competition through economies of scale and aggressive pricing. But it remains unclear just how much pricing

flexibility the federal agency actually has in these ventures. By law, the Postal Rate Commission must approve rates for "mail" services, and the services must be priced high enough to cover direct costs plus agency overhead. But Rothwell insisted that the Postal Service doesn't need such approval for the nontraditional services. "This is unlike other mail services," he said. "We can set rates freely and competitively."

However, big mail customers worry that losses from the electronic services will be recovered through higher rates on traditional mail.

"If they come out with a new service, the associated costs better damn well be reflected in what they charge for the service," said Gene Del Polito, executive director of the Washington-based Advertising Mail Marketing Association, which represents large postal customers.

Competitive advantage

"Anyone that competes with the Postal Service is at an enormous disadvantage," Del Polito said. "They don't pay taxes, they are not subject to antitrust laws and so forth. The question is, do we want the government to play this kind of role when it's possible to have it provided as well — and maybe more cost effectively — by the private sector?"

Rothwell is the first to admit that the Postal Service has advantages over competitors. It has the legal and institutional infrastructure to guard the privacy and integrity of mail of all kinds. It also has the physical assets, including 40,000 retail facilities, to ensure universal service, he said.

The Postal Inspection Service, backed by laws that protect the mail, will bring important advantages to security-conscious users, Rothwell added.

Did you know?

The following are facts about the U.S. Postal Service:

- It handled 580 million pieces of mail a day and took in \$55 billion in revenue in fiscal 1995.
- It is bigger than General Motors, Ford and Chrysler combined; it has 729,000 employees and 40,000 post offices.

Nice tries, poor results

Not all of the Postal Service's forays into the electronic world have been unalloyed successes.

Take its E-Com service, for example. The idea was that advertisers could send flyers electronically to post offices around the country for local printing and hand delivery. The service ended up in the dead letter box in the early 1980s.

The Postal Service said that printing technology at the time wasn't good enough. But Gene Del Polito, executive director of the Advertising Mail Marketing Association, has a different explanation — and one that may spell trouble for new electronic services.

"The real reason it died is the Postal Service could not get the kind of pricing flexibility it needed from the Postal Rate Commission, and so prices were too high," he claimed.

The Postal Service already has stumbled badly in the kiosk arena as well.

Its Postal Buddy kiosk was unplugged in 1993 after less than a year in service. The Postal Service never convincingly explained why it suddenly gave its Buddy the cold shoulder, however. Two weeks ago, it paid out a whopping \$50 million to settle a breach-of-contract claim brought by the inventor of the computerized talking kiosk.

— Gary H. Anthes

pete," Reisner said.

Some of those companies are members of CommerceNet, a Menlo Park, Calif.-based consortium.

"Certification authorities are a missing piece of the infrastructure, so the Postal Service's work in this area is of high interest to us," said Cathy Medich, executive director of CommerceNet.

"For really serious applications," she added, "you absolutely need to have foolproof authentication."



4. Buddha



LARRY GONZALEZ

Privatize, don't criticize

Postal Service: Privatize, don't criticize.

That's the rallying cry behind a proposal from Rep. Philip M. Crane, an Illinois Republican who is worried about the Postal Service losing business to the private sector.

Crane recently introduced a bill that would hand over the huge organization to its employees.

After five years, the service would lose its taxpayer subsidies and the regulatory red tape that makes it difficult

to respond to competitive forces.

"The day is coming when computer-fax-TV-telephone-cable-copier combinations [will be] found in almost every American home," Crane said at a recent hearing.



Illinois' Rep. Philip M. Crane wants employees to own the Postal Service

"And when that day comes, the Postal Service must be able to compete with those new technologies, or it will be relegated to... handling an ever-declining number of rural and high-crime areas and junk mail deliveries." — Gary H. Anthes

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Users stymied by high overseas Internet costs

By Gary H. Anthes

U.S. travelers overseas may be in for a shock when they look at Internet price lists. In some countries, Internet access is so expensive that most people can't afford to drive on the data superhighway at all.

Prices in Delhi may not directly affect users in Detroit, but U.S. users should care about high international rates. Unless prices can be brought down, multinational companies based in the U.S. may be barred by price or simple lack of connectivity to some overseas offices and customers.

"The utility of the Internet is a strongly rising function of the connectivity," said Stephen Wolff, a business development manager at Cisco Systems, Inc. in San Jose, Calif. "If the network is busted up into islands, then it's of diminishing utility to everybody."

But there is encouraging news for overseas Internauts. Increased competition and a climate of deregulation in many countries have resulted in lower prices and enriched service offerings.

The prevailing price schemes



overseas are based on usage. By contrast, U.S. users typically pay a fixed monthly rate for a fixed amount of bandwidth.

Usage-based charging is encouraged by the X.25 protocol that is popular in Europe and elsewhere. X.25 is better at supporting usage tracking than the Internet Protocol that predominates

here.

For example, users in New Zealand pay from \$1 to \$3 per megabyte of traffic in either direction — a punishing rate for any bandwidth-hungry application.

It gets worse. "Shucks, \$1 per megabyte is peanuts," said Wolff, who used to manage the NSFNet backbone at the National Science Foundation. The Senegalese Postal Telephone and Telegraph (PTT) authority charges \$400 per megabyte for Internet traffic, he said.

Not surprisingly, prices tend to be higher where the government has a telecommunications monopoly. "When the PTT is part of the government, [Internet use] is looked upon as a source of revenue to supplement taxes," Wolff said.

Expensive overseas

Prices for dedicated Internet access via 1.5M bit/sec. lines typically are much higher overseas than in the U.S., said Farooq Hussain, a senior manager at MCI Communications Corp. in Washington. For example, prices range from \$4,000 to \$6,000 per month in Japan vs. \$1,500 to \$2,000 in the U.S., he said.

Dial-up access generally is higher overseas; rates in Western Europe are about double those in the U.S., Hussain said. But there are bargain rates to be found. The U.K. has a service that offers 28.8M bit/sec. dial-up access for about \$15 a month.

Users in Switzerland can access the Internet at 28.8M bit/sec. for \$35 to \$50 a month. But that can be overwhelmed by local telephone charges that are as high as \$14 per hour, depending on call distance and time of day.

"The Internet access prices [in Switzerland] will remain stable or go up," predicted Mickey Cog-

gins, technical director at Internet ProLink SA in Geneva. Coggins has some reason for optimism. The World Trade Organization recently got 120 countries to sign a declaration of intent to "liberalize," or deregulate, "enhanced services" such as Internet access.

"So here you have an international norm that says there should be a free and open market for Internet services," said Tony Rutkowski, recent past executive director at the Internet Society in Reston, Va., and current vice president for Internet development at

General Magic, Inc. in Sunnyvale, Calif.

The result should be new services and lower prices, he said.

Rutkowski said joint ventures among U.S. and European carriers are driving down prices and increasing competition. Whole new approaches to communications, such as low-earth satellites, also will lower prices and increase connectivity by increasing the supply of bandwidth, he said.

On-line services are rushing to develop an Internet strategy. See page 53.

Number of Internet hosts by region

	July 1994	July 1995	Percent increase
North America	2.18M	4.52M	107%
Western Europe	730,429	1.53M	109%
Asia	111,278	233,343	109%
Eastern Europe	27,800	67,648	143%
Commonwealth of Independent States and Africa	15,595	42,108	170%
Caribbean, Central and South America	11,455	28,493	149%
Middle East	8,871	21,179	139%
Total	3.09M	6.44M	108%

Source: Mark Lotter, <http://www.nw.com>

Briefs

EU slow to act on intellectual property

BRUSSELS - Despite hearings held last week, the European Union continues to drag its feet on the issue of intellectual property protection for the information society. A consensus emerged from the hearings that automated systems will play an important role in identifying copyrighted works in order to

control use of and access to them. "The Commission will then have to decide whether to make the use of these systems obligatory," said a European Commission official, who asked not to be identified.

Apple may outsource production to cut costs

TAIPEI - High-level Apple Computer, Inc. officials are visiting prospective Taiwanese OEM suppliers in an effort to cut manufacturing costs by outsourcing more of its production, accord-

ing to industry sources. Apple is expected to visit a handful of major Taiwanese OEM suppliers to discuss OEM orders for as many as 300,000 motherboards per month, sources said. The company is looking for manufacturers to expand its systems assembly capacity. Apple also is trying to tie the OEM orders with licensing of the Mac OS, sources said.

Police nab U.K.'s top software pirate

LONDON - Britain's most want-

ed software pirate finally has been tracked down and captured, along with 25 million pounds (U.S. \$39 million) worth of illegal software. A series of raids made at the end of December netted the arrests of the five people thought to be operating Britain's largest software piracy ring. Police found master copies of all the leading business packages plus games software. The main suspect was running what was described as a pyramid of pirates illegally copying the software for distribution.

SHORT TAKES The Open Software Foundation is putting more resources into the Hong Kong region. . . . SAP AG's founding members have transferred 38.11% of their holdings to nonprofit foundations and trusts to protect the company from takeovers, according to the company. Two of SAP's founders, Dietmar Hopp and Klaus Tschira, said in a statement, "The measures we have taken will secure the independence of SAP AG beyond its founders' generation."

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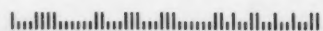
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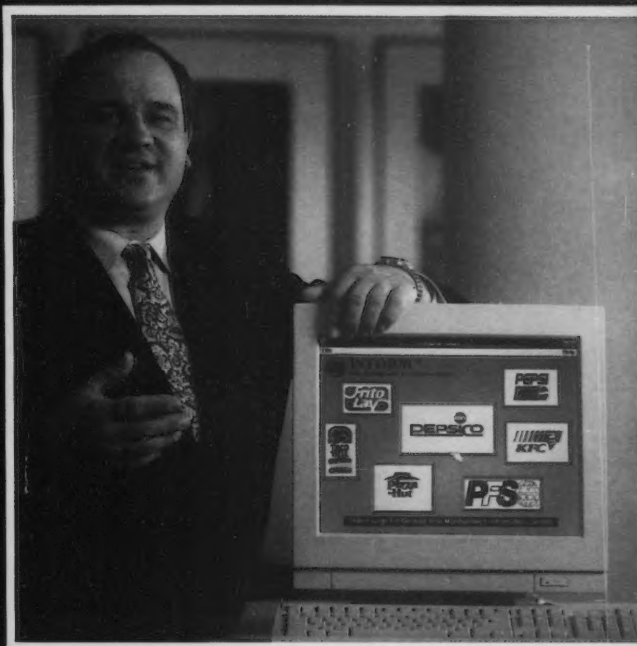
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"INFORMATION BUILDERS HELPED US TAKE THE RISK OUT OF RISK MANAGEMENT FOR PEPSICO."

Alan R. Josefsek
Managing Director
Information Systems Div.
Sedgwick James, Inc.



Like any large operation, PepsiCo, Inc. losses from accident, theft, and seasonal risks come right off the bottom line. And that means PepsiCo subsidiaries and divisions like the Pepsi-Cola Company, Frito-Lay, Taco Bell, KFC, and Pizza Hut, have got to get a handle on these risks to be able to create real-world business plans. How do they do it? With a new risk management system called INFORM™ for Windows™ developed by Sedgwick, the world's second largest insurance broker.

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The INFORM risk management system combines the numbers crunching power of FOCUS with the graphical analysis capabilities of FOCUS/EIS for Windows. The result... PepsiCo managers at all levels can pinpoint critical trends, drill-down for detailed back-up information, identify potential problems, and plan intelligently to minimize risks and maximize profits. Managers can even integrate summary reports with their favorite word processors, spreadsheets and other desktop productivity tools. In fact, the INFORM system is so easy to learn and use, more and more PepsiCo managers are using the system every month.

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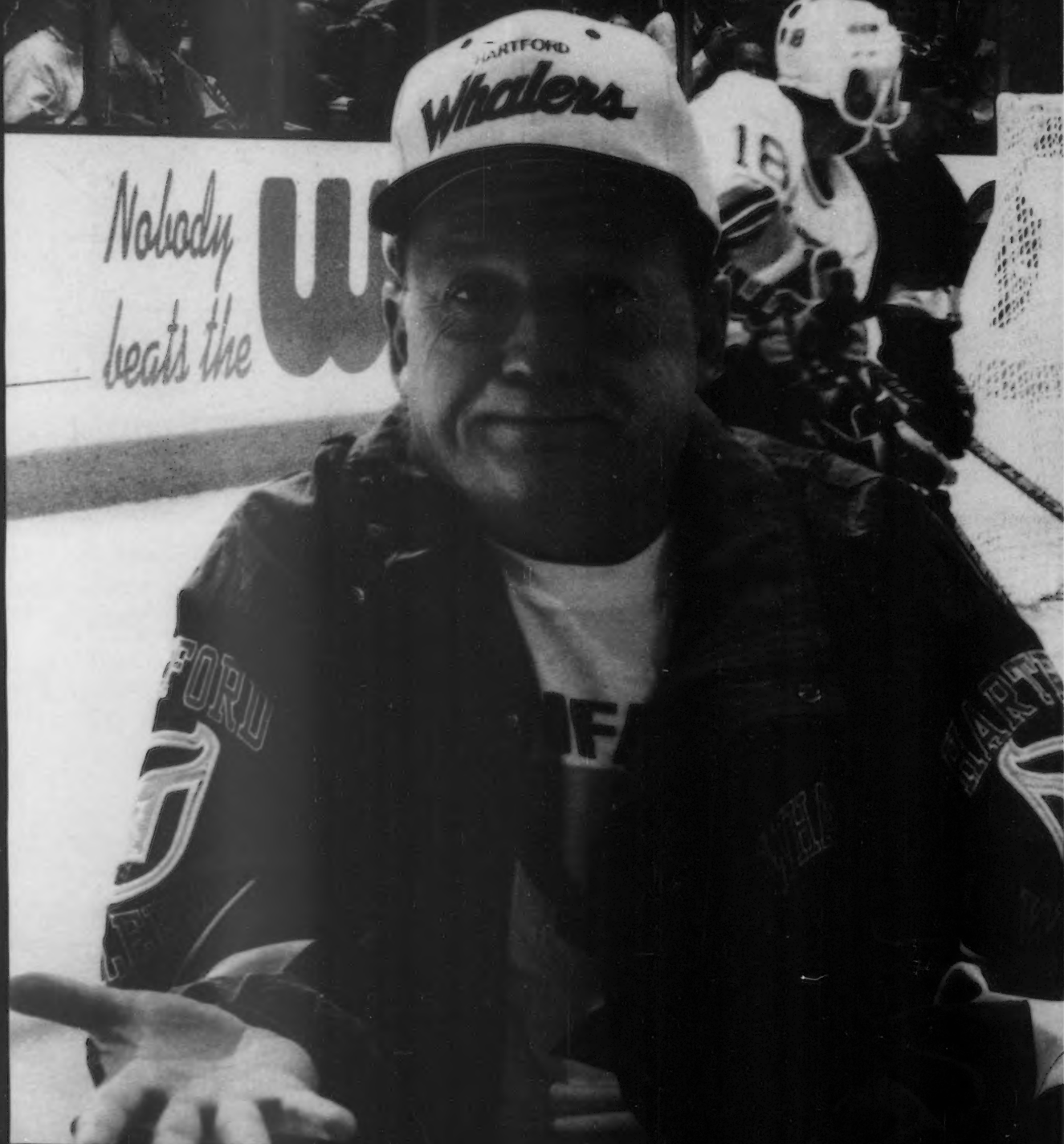
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*A few thoughts about motivation and UNIFACE
application-building strongware from Jim Rutherford,
President/General Manager, Hartford Whalers*





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For a T-shirt like Jimmy's and a UNIFACE brochure, or if you'd like to join our growing list of VARs, fax your business card to 810-737-7119. You can even catch us on the web at <http://www.compuware.com>. Whatever.



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UNIFACE APPLICATION DEVELOPMENT STRONGWARE

WHAT THE BIG GUYS USE

Viewpoint

Users send message

Kudos to *The New York Times* for taking a good look at the man behind the curtain in its front-page story last week detailing the failure of Windows 95 sales to live up to expectations.

The story was printed amid the quarterly cascade of financial results from computer vendors, results that pointed to some possibly peculiar trends. Intel fell quite short of expectations; Apple looked like it was tanking; Dell took it on the chin. These companies have some things in common apart from underperformance, do they not?

On the brighter side of the street, IBM's results were rather rosy, and Computer Associates showcased unexpectedly strong numbers, too. Like our Craig Stedman wrote in *Computerworld's* annual Forecast issue two weeks ago, "It's 1996, and the mainframe still isn't dead." And anyone selling servers, like Sun, is doing just fabulously.

In the meantime, while Windows 95 sales are flagging, sales of Windows NT are booming, surprising even Microsoft. What, if anything, should one read into this swampy porridge of mixed results?

I think it is just this: In the heated battle between corporate users in search of real answers and some vendors whose fortunes depend on the perpetual upgrade merry-go-round, users are starting to win. They are learning to say no to the ghastly proliferation of technology for technology's sake. They are asking far more probing questions during their needs analyses, such as "How will upgrading our 8,000 PCs to Windows 95 help us to sell more insurance or build better machine parts or write more mortgages?" If the answer isn't clear, they just don't buy.

These users continue to confound large elements of the vendor community by finding new ways to get mileage out of their current systems while paving an orderly route to newer distributed systems. That's one reason companies such as IBM and CA continue to boom and why companies selling midrange servers and server software are also doing so well.

Of course, it's always important to remember we are seeing the fortunes and misfortunes of these and other companies at a single point in time, and we shouldn't read too heavily into them. Still, there are some underlying themes that bode well for the user community—and for those vendors that truly understand the forces that shape that community.

Bill Laberis

Bill Laberis, Editor
Internet: bill_laberis@cw.com



Year 2000 is a problem; Is not! Is so!

The real issue [regarding year 2000 conversions] isn't PC BIOS problems, but PC application problems. Many applications still prompt for and validate only two-digit years. The big vendors have addressed this problem. But it still doesn't fix internal applications, many of which were written by users during the initial PC boom before development was reined in and standards enforced.

Anyone who thinks the [year 2000] problem won't affect them because they don't have a mainframe will likely have a rude awakening on Jan. 1, 2000. Many of the problems are subtle. Testing each application is the only real fail-safe [plan].

Keith Stone
Winston-Salem, N.C.
kstone@crewestone.com

Wayne Socha's letter [Dec. 18] reports that he tested three PCs and didn't find a year 2000 problem with any. He concludes that the year 2000 is only a mainframe problem. That would be a dangerous assumption. It is possible that Socha was extremely lucky in his choice of PCs to test. Three isn't a large sample.

The BIOS date in most PCs won't roll over correctly if they are turned off at the time of the rollover—a likely condition for large numbers of PCs on New Year's Eve. This has been confirmed by many people testing many different machines. IBM has published a list showing that the vast majority of PCs they have produced won't roll over correctly.

Robert J. Sandler
Teaneck, N.J.

As the proverb goes, people who live in glass houses shouldn't throw

stones. Letter writer Stuart Cohen [CW, Dec. 18] took you to task for not doing adequate research on leap years. He should have done "adequate research" himself.

It is not true, as he wrote, that even centuries (1800, 2000) are leap years. Century years that are divisible by 400 are leap years, including 1600, 2000, 2400, etc. The others, 1700, 1800, 1900, 2100, etc., are not.

I hope nobody has implemented a system based on Cohen's rules—although it would be 204 years before the error showed up!

Efrem Mallach
Chelmsford, Mass.
mallache@woods.uml.edu

The year 2000 is no problem for us ["Controversy roils over year 2000 conversion toll," CW, Dec. 18]. We have been dealing with the problem since 1970 when we first had to accommodate 30-year bonds coming due in 00. The simple modulo 4 leap-year routines will work fine in 2000, which is a leap year.

The impending disaster for which we have made no plans will occur on Feb. 28, 2100. That year isn't a leap year. So the modulo 4 rule for non-century years gives the right answer for 2000 but the wrong answer for 2100. As Stuart Cohen's letter in the same issue shows, lots of us are confused by the leap-year rule for century years and lots of programs will do the wrong things in 2100.

However, I expect that long before 2100 some other programmer will make major revisions to my code to accommodate changes on laws and technology, so I won't worry.

Bernard Abrams
Old Bethpage, N.Y.

Unabomber wanna-be?

Is Marc Gunderson serious ["We're losing our creative minds," CW, Dec. 4]? Is he really a Unabomber wanna-be, pinning for mankind to throw off the yoke of technology and go back to the natural state?

No matter how creative you are, there is always someone better. Whenever the mediocre artist improves himself with a certain tool, a more creative [artist] can do that much more with it.

Also, someone always breaks the rules. Just when mediocrity sets in, someone upsets the applecart.


Finally, things get old quickly. Presentations and publications that were slick a couple of years ago now evoke yawns. The creative know this and push the envelope constantly.

By the way, this E-mail was written by a twentysomething, tech-school graduate without the aid of a thesaurus or spell checker. I dare you to find a significantly superior letter.

John W. "Zerkman" Graham
Myrtle Beach, S.C.
jgraham@interserv.com

■ Computerworld welcomes comments from its readers. Letters should not exceed 200 words and should be addressed to Bill Laberis, Editor, Computerworld, P.O. Box 9171, 500 Old Connecticut Path, Framingham, Mass. 01701. Fax number: (508) 875-8931; Internet: letters@cw.com. Please include an address and phone number for verification.

{ The decision }



Variable	Definition	Source	Period
Age	Age in years	Survey	1990-1999
Gender	Male/Female	Survey	1990-1999
Marital status	Married/Single	Survey	1990-1999
Education	High school/Graduate	Survey	1990-1999
Income	Log of annual income	Survey	1990-1999
Health	Good/Poor	Survey	1990-1999
Religion	Protestant/Catholic	Survey	1990-1999
Region	North/South	Survey	1990-1999

*Average street price for entry-level model with 75MHz/540MB HDD and 8MB RAM (no L2 cache). Monitor not included. Dealer prices may vary. *M - F, 8am - 8pm EST. In Canada, call IBM's HelpFax at 1 800 465-3299 (ask for document # 65215). IBM's Statement of Limited Warranty is available by calling 1 800 772-2227. *Hardware support during warranty: preloaded operating system support for 60 days; excluding some holidays. IBM is a registered trademark and NetFinity is a trademark of International Business Machines Corporation. Pentium is a registered trademark of Intel Corp. © 1995 IBM Corporation.

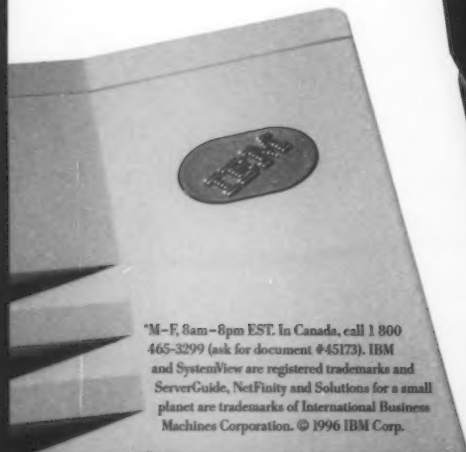
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Verbatim

SOME WORKPLACE PREDICTIONS FOR 1996 BY CLEVELAND-BASED BUSINESS FUTURIST ROGER HERMAN:

The number of people telecommuting from home will increase by about 60%. More employers will encourage this arrangement (and will enjoy) savings in space and utilities while increasing productivity.

An increasing number of employers will hire telecommuters from outside their local area. Using the Internet and wide-area networks, more people will commute interstate to work each day, without ever leaving their homes.

Attendance at trade association conventions will increase, fed by a growing economy, a stronger move toward strategic alliances and a wider range of people engaging in serious networking to create their next job opportunity.

Federal, state and local governments will shift their positions to be more supportive of home-based workers including telecommuters, entrepreneurs and on-call independent contractors. Tax regulations and zoning gradually will become less tight, and more homes will be designed and built to accommodate home-based workers.

FROM THE MCLUHAN CENTER FOR MEDIA SCIENCES IN TORONTO:

Another McLuhan projection for 1996-97 [is] the "disappearing site."

[World Wide] Web sites will be delisted for several reasons: sponsor will conclude that the site was an error in the first place; [increased] maintenance and update costs; to conserve system resources and assure access for paying customers. Of the three, the last reason will be the most potent. As [commercialism] hits the 'net, expect many Web sponsors to discourage casual "hits" from non-paying customers. Also, expect high-security unpublished sites and possibly even a book titled "Secret Web Sites" or the equivalent.

New times require new job descriptions

Michael Cohn

In the old days, you could walk into an IS shop and tell who was whom. There were programmers, architects, a chief information officer — or at least a new one every month — and all was well with the world.

Today, things are a mess. No one's happy with old technology. No one understands new technology. Systems are confusing; users are confusing. IS professionals wear many hats and still worry about losing their heads.

It's time to rethink IS, build a new organizational chart and reorganize your department for the tools and technologies you face today. Forget programmer/analysts, database administrators and the job descriptions you once knew. To run a tight ship in the '90s, you need new types of employees, such as the following:

Legatier. How do you go from legacy systems to three-tier client/server? Companies now need legatiers: folks who can manage complex, enterprise-wide projects and figure out how to get from tired-iron to state-of-the-art. But don't bank on just anyone becoming a legatier. You need a few decades of hands-on experience with mainframes and middleware, images and objects, Windows and warehouses. And how long will it take to find someone like that? Probably a few decades.

Decruiter. Recruiting is dead. Now it's decruiting, or trying to keep the people you've got.



Get ready to become a webammer, CEO schmoozer, decruiter and printer-unjammer.

Is your team halfway through a SAP conversion? Did you just train your staff in objects? These folks are hot: They're getting offers right and left. So stop the flood of resignations and decruit your folks from evil headhunters. You'll be amazed at people's company pride. You'll be impressed by their corporate loyalty. But just in case, I'd throw in a bigger cubicle and maybe a parking spot near the door.

Explaining client/server

Mahoganite. Someone has to keep tabs on the executive folks in the wood-paneled offices. It's a full-time job to schmooze with the CEO, convince him IS is important and keep outsiders from his door. And the most important job is explaining why it's time for a new \$3 million client/server project and hoping he won't ask what happened to the old \$3 million client/server project.

Webammer. Every business needs a page on the World Wide Web. But do you want to assign it to some undeserving programmer or to a leading-edge Internet junkie who eats, sleeps and lives the Web? You need a webammer, someone who works all day and goes home and surfs the 'net all night — as opposed to a programmer, who works all day, doesn't go home and has to work all night.

Directitect. There are no more cushy IS director jobs. Now you have to be a directitect, a combination leader, architect and programmer. We're all so short-handed that you have to roll up your sleeves, pick up the slack and do whatever needs to be done. And don't expect any relief when you get promoted; you'll likely end up as a CIO — chief information operator.

Recopetary. Even with half of IS laid off, someone still has to play the role of receptionist, secretary, copier-fixer and printer-unjammer. There's no sense hiring someone, because today everyone has to pitch in. So the bad news is that for about 15 minutes a day, you will probably be standing in the wrong place at the wrong time and become the recopetary. But don't be alarmed. The good news is that this is longer than most folks last as CIOs.

Cohn toils at a large company in Atlanta where he is a "management insulant."

Strong medicine for IS and users

Michael Gentle

Back in the '60s and '70s, roles and responsibilities were clear. Users were like medical patients except with business problems to cure. IS professionals were like doctors who diagnosed problems and provided remedies.

It wasn't an exact science, of course. The technology was primitive, accurately diagnosing the user requirements was difficult, and the bills usually were steep. Despite the problems, users didn't attempt to play doctor; the complexity of the technology ensured that this wasn't even an option.

Today, a new generation of users has the same business problems to solve but considerably more options. The availability of off-the-shelf PC software lets end users shop around for themselves. After coming of age with spreadsheets and word processors, users understandably feel confident enough to go their own way.

In short, self-medication is in. Patients can now choose to bypass their traditional family doctor — the IS department.

Dissatisfaction with IS runs high in this scenario, often for justifiable reasons. Some user departments build custom PC applications that the IS department was unable or unwilling to build. Users are euphoric as they are treated to whizbang demonstrations of graphical user interfaces. Shortcomings are easily brushed aside by vendor



Bypassing the family doctor — the IS department — could be hazardous to your business' health.

assurances of product flexibility.

The head of the user department signs on the dotted line — and then the reality check starts: The demonstration version still is buggy. Functional enhancements turn out to be more complex than first thought and will take at least six months to complete. Interfacing with legacy data is a headache because IS was consulted as an afterthought. Consulting fees are outrageous due to a shortage of product specialists. Serious performance problems appear when the application is scaled up to production volume. With the project behind schedule and over budget, the CEO stops the show and calls in IS to clean up.

In hindsight, of course, it's easy to see what went wrong. With the end users' view of software limited to the user interface — the tip of the iceberg — \$99 shrink-wrapped software ends up being confused with company-specific, \$100,000 systems. Vendors have a field day with users who

are easily fooled by fancy graphics and rarely ask questions about licensing costs, upgrades, support, scalability, data models, performance and synchronization issues for remote users. By the time the magnitude of the submerged portion of the iceberg becomes known, it is too late.

So what is the IS department's role? Only the naive would believe that IS can now step in to reclaim its territory. On the contrary, IS needs to get its house in order and become more customer-focused to prevent such scenarios from happening in the first place.

Users need to understand that identifying a deficient IS department is one thing, but thinking they can build better systems is naive. There's only so much self-medication you can administer before you start jeopardizing your own health. You don't cure an illness by making an enemy of the doctor.

Fortunately, there can be a happy ending if IS and users learn from past mistakes and start working together. Meanwhile, maybe PC software should be shipped with the following warning: "The surgeon general has determined that embarking on large-scale client/server projects without adequate IS involvement can be hazardous to your health."

Gentle is an IS project manager at SmithKline Beecham Pharmaceuticals in Paris.

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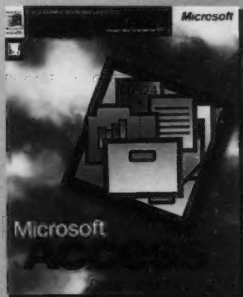
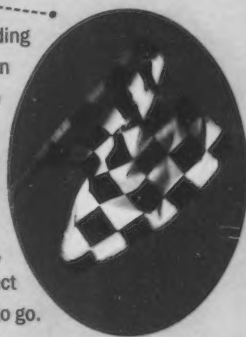
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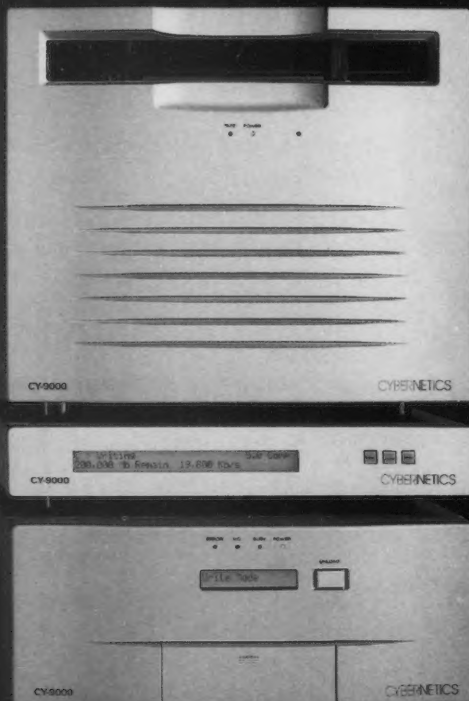
Give people the tools to set their data in motion. Now that finding information is quick and easy, users can spend more time turning it into an advantage for your company. New Microsoft Access works seamlessly with the Microsoft Office family of applications. Consistent tools, like the Answer Wizard, mean users spend less time getting started, so your company saves time and money. People have the capability to take analysis another step by using Microsoft Excel PivotTable® Wizard to see the names and numbers retrieved by Microsoft Access in a clear and dynamic way. And with the Microsoft Word Mail Merge Wizard, users can combine data like names and addresses with documents. They just select the data to merge, the document to mail, and Microsoft Access sets everything up to go.



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Because slow backup and restore can cost you *plenty* — in system time, in delayed customer response, and in wasted resources.

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The cost of system time varies from site to site, but a recent study has put the cost of a medium sized PC LAN at **\$18,000 per hour** — and the cost of a UNIX network at **\$30,000 per hour**.^{*} Numbers like that make it easy to understand how a backup/restore solution that can do its job faster can save you serious money.

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\$9,000 over 3590,
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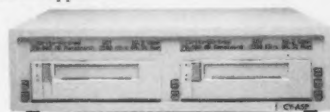
And you won't need to change tapes...

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^{*} Sentry Market Research

^{**} All drives, except VHS, are available with data compression.

LARGE SYSTEMS • WORKSTATIONS • PORTABLE COMPUTING

NCR, the sequel

Profitability hopes pinned to servers

By Neal Weinberg

After five years of occupation by the armies of AT&T Corp., NCR Corp. has reclaimed its name and is looking to a new line of WorldMark enterprise servers to lead the march back to profitability.

NCR, a victim of a \$7.4 billion hostile takeover in 1991 and renamed AT&T Global Information Solutions in 1994, took back its name last week. Dayton, Ohio-based NCR will gain complete independence by the end of the year as part of AT&T's decision to split into three separate companies.

In an effort to stem its money-losing ways, NCR is cutting 8,500 jobs. It also is getting out of the PC manufacturing business and instead will focus on high-end symmetrical multiprocessing and massively parallel processing computers for commercial data warehousing.

The company will target users who have large databases of retail point-of-sale information or who perform a large amount of finan-

cial transactions, said John Giering, NCR's chief financial officer.

WorldMark — the Intel Corp.-based Unix server line — is a solid product that moves NCR from proprietary to open systems, said Wayne Eckerson, an analyst at Patricia Seybold Group in Boston.

WorldMark is "ramping slowly," said Paul McGuckin, an analyst at Gartner Group, Inc. in San-

tion's No. 1 retailer — as a customer, defections have occurred.

"They are, in many senses, starting over from scratch in data warehousing," McGuckin said. NCR also faces strong competition from players such as IBM and Tandem Computers, Inc.

Anticipating a return to the NCR of old, users seem elated that the company has taken its old name back.

"It's definitely a positive move for them," said Michael Garrison, manufacturing and industrial engineering manager at State Industries, Inc. in Ashland, Tenn. "My greatest hope is that not only do they change the name back, but that they change the way of operation back, too."

Garrison said NCR has continued to make top-notch products.

"Fortunately, AT&T didn't mess up that part of it," he said.

David Barrett, vice president of information technology at Invesco Funds Group, Inc. in Denver, said changing the company's name back to NCR was "the smartest thing they could possibly do."

NetFrame's chairman steps down. See page 100.

Same as it ever was

NCR Corp., which is being spun off from AT&T Corp., has trimmed its product line and is focusing on fewer vertical markets

	IN	OUT
Products	WorldMark Series Enterprise Server	Globalyst PCs
Markets	Retail, financial, communications	Transportation, government, manufacturing

ta Clara, Calif. He said WorldMark orders have reached \$100 million since the product's introduction in September.

Not enough retail

Eckerson's perspective is that NCR lost quite a bit of market momentum while it was part of AT&T. And although it still counts Wal-Mart Stores, Inc. — the na-

HP's plans for server revealed

By Michael Goldberg

Potential users of the HP 500 Windows Application Server will require 32-bit applications, so Hewlett-Packard Co. has unveiled a plan to make this system more robust.

Analysts and users are high on the HP 500 for its ease of use and performance. But observers said HP needed to announce its plans for the server or risk losing a chance to build momentum for the product. HP "was forced to make this announcement because the installed base is looking forward to

32-bit applications," said Eileen O'Brien, an analyst at International Data Corp. in Framingham, Mass.

HP still needs to boost the image of the HP 500, said analyst Greg Blatnick, vice president at Zona Research, Inc. in Redwood City, Calif. The HP 500, a workgroup server, uses Locust Computing Corp.'s Merge to give users with Unix workstations or X Window System terminals access to Windows-based applications.

"This is a new kind of product category, and there's a lot of work to be done to make people aware of it and then to make them [comfortable] that it will perform as people would expect" Windows applications to run, Blatnick said.

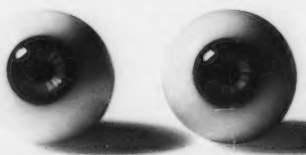
Engineering access

At Intelsat, an international satellite agency based in Washington, Panos Papaioannou said the HP 500 satisfies the needs of the software engineers in his office, but he is looking forward to improvements.

The HP 500 "allows our engineers to access, without any problems, all Windows applications — MS Word, Excel and so forth — and Windows applications that we developed here," said Papaioannou, manager of software engineering information systems. He said he will use 32-bit applications for Windows NT or Windows 95 in the future and will need the HP 500 to keep pace with his needs.

HP 500, page 38

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447X	17"	1280x1024	85Hz	150W	15.5"	1.5"	\$1,499	Available	Professional caliber



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JANUARY 22, 1996 COMPUTERWORLD

Servers & PCs

Merger may give push to high-end PC servers

By Bob Francis

The merger of RAID controller vendor Mylex Corp. with I/O bus adapter vendor BusLogic, Inc. may add fuel to users' move toward high-end PC servers.

The deal could prompt users to move faster toward higher-bandwidth I/O host

adapters for servers and desktop PCs. Mylex and BusLogic see the need for high-end SCSI and Fibre Channel adapters in the marketplace, according to Jim Porter, president of Disk/Trend, Inc., a research group in Mountain View, Calif.

Mylex in Fremont, Calif., is acquiring privately held BusLogic in a stock transaction

that is valued by industry analysts at between \$35 million and \$40 million.

Adaptec, Inc. in Milpitas, Calif., traditionally has been the primary supplier for high-end PC servers from companies such as Compaq Computer Corp., Hewlett-Packard Co., IBM and Dell Computer Corp.

But the merger adds another supplier to that mix, Porter said. "If that market grows as expected, companies [such as] Compaq and HP will need more than one supplier to depend on for those components," he said.

Fast growth

The merger with BusLogic in Santa Clara, Calif., also brings Mylex into a rapidly growing market, according to some analysts. The SCSI host adapter market is barreling ahead as more corporations begin to use Intel Corp.-based servers for their large networks.

The SCSI host adapter market will top 19

million units shipped this year, industry officials estimated. The overall market is expected to bring in between \$600 million and \$800 million, the officials predicted.

BusLogic will add key SCSI technology and application specific integrated circuit (ASIC) development abilities to Mylex. The ASIC capabilities will give Mylex more control over the design of its RAID controllers.

More important for IS managers will be the addition of SCSI and Fibre Channel technology. Fibre Channel is a new bus technology that promises data-transfer rates of up to 100M byte/sec., compared with the 40M-byte/sec. rates of SCSI. The addition of BusLogic will help Mylex more easily integrate Fibre Channel technology into its products, analysts said.

The two companies will have about \$150 million to \$170 million in combined annual sales. That still falls far short of Adaptec, which earns \$700 million annually.

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AD_CWJA226

Briefs

Lawsuit against StorageTek dismissed

A Colorado district court judge dismissed the last two claims in a lawsuit filed against Louisville, Colo.-based Storage Technology Corp. by a former development partner. The plaintiff, Stuff Technology Partners II, alleged that StorageTek breached a 1990 settlement agreement that let both companies use jointly developed optical technology. The first 14 claims against StorageTek were thrown out by the judge last June.

Intel takes Phoenix stake

Intel Corp. in Santa Clara, Calif., is acquiring a 6% stake in Phoenix Technologies, Inc., a developer of BIOS software that is based in Santa Clara, Calif. BIOS is a software layer that allows a

PC's operating system to communicate with hardware devices such as a disk drive or a CD-ROM drive. Under the deal, the two firms will work together to integrate Phoenix's software on Intel desktop and server motherboards. The companies' engineering groups now are developing the detailed implementation plans for Intel to transition to Phoenix's system software this year.

New chip from Mips

Mips Technologies, Inc. in Mountain View, Calif., announced its 200-MHz R5000 RISC processor. The 64-bit chip comes with a 32K-byte primary cache and integrates on-chip support for an external secondary cache of up to 2M bytes. The R5000 sits between Mips' R4400 and R10000 chips and is aimed at the entry-level Windows NT-based "personal workstation" and low-end Unix server markets.

HP 500

CONTINUED FROM PAGE 37

Plans for the HP 500 should provide:

- Compatibility with Windows 95 and 32-bit applications in the second half of this year.
- Increased Windows application performance, starting in the second quarter of

1996 with the introduction of Intel Corp.'s Pentium Pro processor.

- Symmetrical multiprocessing beyond two processors to support up to 128 users.

Using one or two Pentium processors and running on SCO, Inc.'s SCO Unix, the dual-processor model of the server supports about 30 users. It uses Pentium chips, but applications run as if they were on an Intel i486-based PC, HP said.

HP 500 Version 1.1

Windows Application Server

Model	1-processor model	2-processor model
Type of processor	90-MHz Pentium	90-MHz Pentium
Maximum number of users	15 users	30 users
Memory	64M bytes	128M bytes
Disk storage	1G byte	2G bytes
Price	\$16,500	\$24,995

JANUARY 22, 1996 • VOLUME 11, ISSUE 1

COMPUTERWORLD

•Leadership Series•

The New

CIO/CEO

Partnership

KNOWLEDGE MANAGEMENT

IS A PREREQUISITE

FOR COMPETING IN THE

INFORMATION AGE. IT'S

ALSO AN OPPORTUNITY

FOR THE CIO TO GET OFF

THE BENCH AND INTO

THE HUDDLE.

BY HARRY M. LASKER
AND DAVID P. NORTON



In today's rapidly changing business climate,

corporate leaders must be ready to adopt new approaches to align information technology strategies with overall organizational strategies. The CIO can play a crucial role.

The old model, which focused on using IT to cut costs by improving transaction processing performance and other data flows, has reached the point of diminishing returns. As companies move further into the Information Age, using IT to convert knowledge into revenue has more value than deploying more processors to further reduce transaction processing costs — it also has implications for the chief information officer's future.

Improving the economics of an organization comes from a shift in performance — that is, the ability to do new things or do old things better. For instance, currency traders with the most up-to-date information and insights will outperform less well-informed investors. Accumulated corporate know-how is the basis for performance, and improving performance is a function of learning.

Managing knowledge and learning is based on three principles:

- **Alignment.** Don't map the knowledge-creation process of your organization until you can link it to your business strategy or the performance that pushes that strategy.
- **Forward thinking.** Improving performance means de-



veloping new core competencies that do not exist inside the company today but must be learned.

- **Communication.** Learning is a social activity, and reaching new performance levels requires greater communication across the organization.

IT is key to addressing all three principles, and the CIO is in a position to play a critical role. His job is made easy because rarely will he have to battle for additional resources. Up to 90% of the infrastructure required for knowledge management already is in place in most organizations in the form of existing networks and servers. Therefore, only a small shift in the IT

budget is required, usually less than 5%.

One such resource shift involves creating user-friendly interfaces that encourage employees to share information across the network. By formalizing the collection and dissemination of information, a company can create a learning loop. (See "Inside a Learning Loop" on facing page.) Captured information might include such things as changes in customer strategies, rumors of a new competitor in the market, or a trade-press article describing a new regulatory threat.

A major battle the CIO faces is to win the respect and cooperation of other senior managers. Often perceived as a latecomer to the game, he must defend his ideas for planning and implementing an enterprise-wide

knowledge management strategy. For example, the elaborate securities trading systems at many financial institutions are almost always outside the development and control of the CIO. The CIO must convince his peers and the CEO that he alone is in a position to ensure that the system works across the entire enterprise and is capable of growing and adapting.

A case in point: This month, Ron Ponder, AT&T Corp.'s CIO, assumes responsibility for the telephone company's business- and consumer-customer service departments. The change is due in part to a recognition by top management of the role that IT plays in managing knowledge for customer service. Ponder and other managers currently are weighing ways to extend knowledge management throughout the rest of the corporation.

Another company that is evolving knowledge management capabilities is CIGNA Property & Casualty. Both AT&T and CIGNA understand the role IT — and the CIO — plays in the relationship between knowledge and performance.

Case Study: AT&T

As part of its recent re-engineering efforts, AT&T's Business Communications Services (BCS) division in Bedminster, N.J., last month rolled out a knowledge management system to personalize customer service. BCS personnel now use an on-line help system to provide faster and more customized service. The system includes a sophisticated interface and advanced middleware that allows a customer service associate to access information from mainframe systems and integrates desktop tools, such as fax, imaging and word processing.

For example, when a customer calls with a question about a telephone bill, a customer service associate immediately can go into the business module, click on billing and find a menu of activities to choose from to resolve the problem. An internal World Wide Web site — or intranet — provides the network foundation that integrates customer information, according to Gene Speicher, division manager of AT&T's BCS Customer

INSIDE A LEARNING LOOP

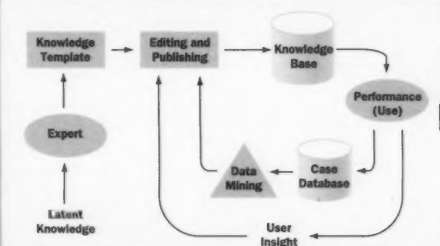
Organizations mobilize learning and create knowledge by developing processes for collecting and assimilating information, assessing its value and applying it to the processes of the company. This results in cycles called learning loops. Learning loops allow for rapid feedback and behavior modifications and immediately affect future performance. The corporate knowledge base thus expands, and "smart" companies with "smart" processes emerge.

In the example illustrated here, an "expert" in the field submits an observation or fact that directly relates to the performance of the unit. It is reviewed by internal editors, usually senior officials with a background in the particular area. They then pass the usable information to publishers — individuals with the authority to determine policy — who then approve distribution of the information into a database for use by others. Published information

is then refined by those who use it and describe the impact of that information.

Here's how the process works in the insurance industry. Say a claims agent working with chemical industry clients realizes that several injuries all seem to be related to the use of a new solvent. The material leaves an invisible residue that diminishes the lubricating effect of certain plastics and damages equipment if it is not used properly.

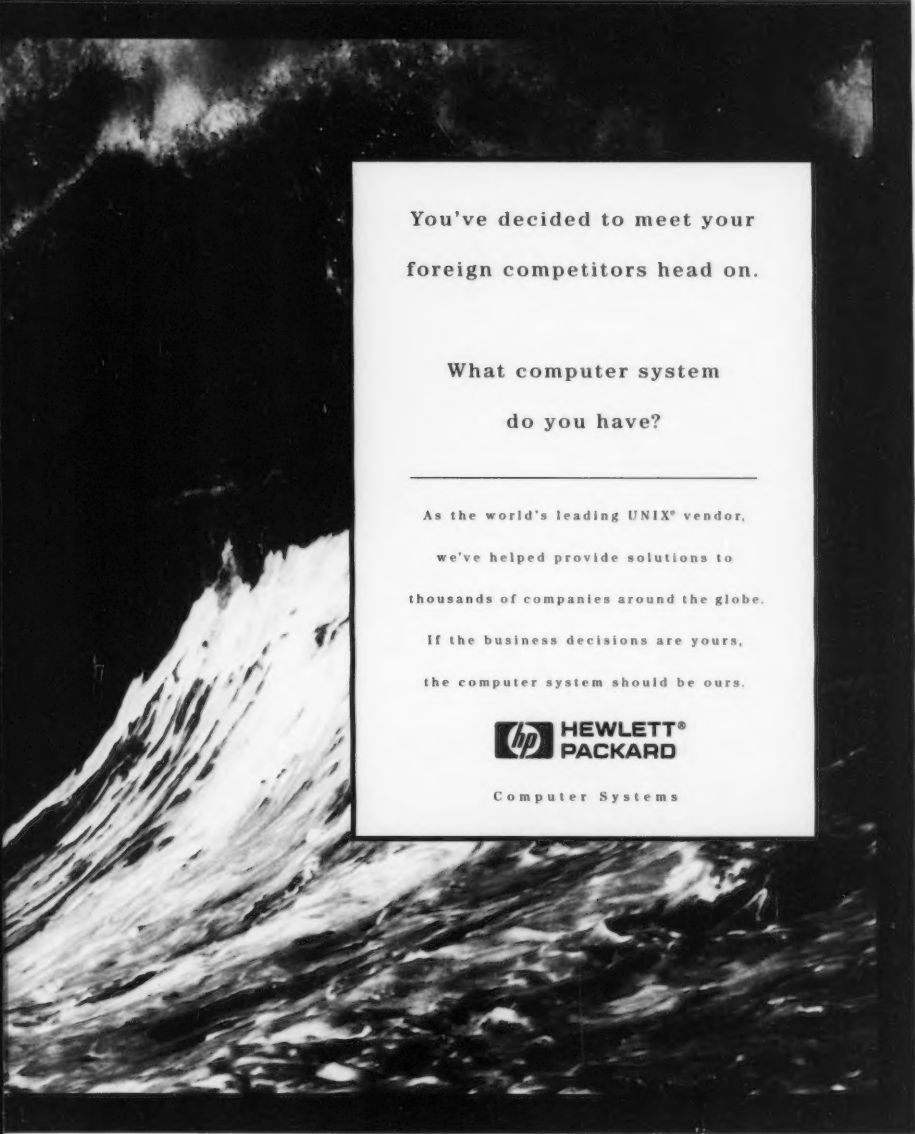
The claims agent submits this observation to the knowledge management network. An underwriter-editor then recognizes, from routine reports filed by sales agents, that other clients also use the new solvent. In addition, the underwriter-editor determines that the manufacturer of the solvent also is a client. The editor alerts a supervisor-publisher, who distributes an alert to the solvent manufacturer's salespeople as well as to other sales staff and claims agents.



Source: Renaissance Solutions, Inc.



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Computer Systems

Care unit. The network allows the associate to look up the bill and the disputed call and to determine whether the customer made the call or not, in part based on an analysis of prior calling history and other factors. The system guides the associate through the job by providing on-line help for various service scenarios.

Previously, AT&T's employees did not have access to information about customer problems, company policies and other relevant data when they were on the telephone with a customer because the information was dispersed across multiple systems and even paper manuals. The new client/server desktop application cuts across the old systems to deliver a more comprehensive picture of a client's situation on the associate's screen.

"Before, information was so fragmented and split up in stovepipes, it was hard for the customer service staff to build a relationship with a customer," notes Jan Scites, AT&T vice president, BCS Customer Service. "Now we have the ability to make changes quickly, and it expands the scope of their jobs."

One result of better knowledge management is that AT&T customer service associates see the potential for radically improving response times to customers. According to Speicher, the system improves productivity by mechanizing the steps that previously were less automated.

In the past, customer service associates had to access multiple on-line and manual information sources to determine the right way to proceed with problem resolution; now, that is all mechanized with the new on-line help facility.

As AT&T has found, once the tools are in place, a learning loop develops quickly. Customer service representatives, field sales agents, maintenance crews and others who are in direct contact with customers, competitors and other

internal departments contribute their insights and observations through the intranet to their managers. The managers then review and "edit" the submitted information and "publish" the insights on a knowledge database for use by others in the organization.

Case Study: CIGNA

Of course, getting people to share information willingly is one of the most difficult aspects of knowledge management. "You have to create an upward spiral for know-how to be shared," says Tom Valerio, senior vice president, transformation, at CIGNA Property & Casualty, a Philadelphia-based insurance company.

In an upward spiral, knowledge and information contributed by employees is processed by "knowledge editors" — such as experienced underwriters and other senior officials — who distribute it across the organization. For instance, senior underwriters might gather data from the field offices and broadcast relevant information to associates and superiors over CIGNA's internal network.

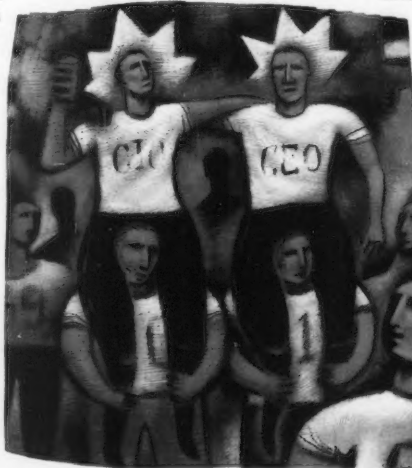
"If you can create a learning loop, where you're constantly creating and accessing individual knowledge, and if you have the right infrastructure, you're creating organizational know-how," Valerio says.

"As the individual's know-how improves, so does his performance."

Exploiting knowledge management is critical for CIGNA. In 1993, it lost more than \$250 million. It has rebounded — in the third quarter of 1995, the company had a pretax profit of \$60 million — partly because knowledge management is an element of a re-engineering effort. As a result of re-engineering, CIGNA's management reorganized the company from a general commercial carrier to an insurance specialist.

CIGNA uses knowledge

**CIGNA FOUND THAT
QUALITY, NOT QUANTITY,
OF INFORMATION
IS KEY TO PROFITABLE
UNDERWRITING.**



management to discover and maintain profitable niches. The skills and experience of its people in underwriting and claims have become the building blocks of the new CIGNA. Their knowledge is being used to determine which niches to enter and to what extent. "Knowledge held by the individual worker is one of the most critical components to CIGNA's new strategy," Valerio notes.

The insurance company began the knowledge management process by developing a performance model for underwriters. A performance model identifies the types and sources of knowledge required for completion of any step in a process. The CIGNA model systematized the key steps in the process of reviewing an application for insurance. Once CIGNA had determined that there were 29 key steps in the underwriting process, it was able to link specific databases to specific steps. For instance, government data on workplace injuries could be linked to the step that requires collecting accident history for the industry segment of a prospective customer.

Most of the CIGNA employees who collect and disseminate information — the editors and publishers — are underwriters. They are both knowledgeable about the industry and have the time and tools to work with the information. They process information submitted by sales agents, claims agents and others in the organization and then distribute it via the client/server network throughout the company, thus creating a learning loop.

The company found that the quantity of information was not the key determinant of profitable underwriting. Rather, it was the quality of the information. "Every company has a ton of information in its databases," Valerio notes. "The key to profitable underwriting isn't giving access to every bit of information that's important, it's how you determine which information is relevant and how you tailor it."

IT has been important to CIGNA's transformation. The company has a CIO for the corporate entity, and each division has an information systems officer, or DISO. The DISO of the property and casualty unit was a participating member on the executive steering committee that managed the major project initiatives, and the DISO staff was involved directly in the knowledge management initiatives.

In addition, the DISO sponsored the technology for each of the company's three major initiatives: producer relations, underwriting and claims management. The CIO reviewed the ways technology was being used in each of these three areas.

The CIO's Challenge

Knowledge management can offer CIOs and CEOs an opportunity to forge a new relationship by focusing on their complementary roles in implementing the knowledge management system. The considerable technology assets most companies have in place can be used to promote learning and boost performance. With the right interfaces, the desktop and the network allow employees to be the "eyes and ears" of the organization, plugged into a multitude of learning loops.

However, the CIO must recognize that the IT department cannot control the knowledge infrastructure. Instead, he should set his sights on becoming a senior partner in the knowledge management process. At both CIGNA and AT&T, the IT organization is intimately involved in knowledge management.

The CIO's role is to build the infrastructure and to develop the interfaces that support the free flow of knowledge. If he embraces the opportunity, he will earn a place in the huddle. If he resists, the IT department is destined to play a supporting, rather than a strategic, role in the company's future.

It's decision time for CIOs. ♦

Additional reading

Harvard Business School case study (N1-195-228) on CIGNA's knowledge management program, "CIGNA Property and Casualty Re-engineering (A)," by Richard L. Nolan and Donna Stoddard, June 1995.

"Mapping Corporate Brainpower" by Thomas A. Stewart, *Fortune*, October 30, 1995.

"Getting Real About Brainpower," by Thomas A. Stewart, *Fortune*, November 27, 1995.

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CLIENT/SERVER APPLICATIONS • DEVELOPMENT TOOLS • OPERATING SYSTEMS

Filling replication gaps

by Tim Ouellette

The Notes 4.0 upgrade improves on Version 3.0 for replicating data, most observers agree. But third-party vendors are filling in some of the remaining cracks to make the experience even more bearable for users.

Expected at Lotusphere '96 this week is DYS Analytics' Analyzer software for replication scheduling, an upgrade to Technology Investments' Adaptive Replication Engine. New versions of relational database-to-Notes replication software from Casahl Technology, Inc. and Percussion Software, Inc. are also expected.

Notes administrators at SmithKline Beecham Corp. in Philadelphia were manually collecting and analyzing replication data on their 170 Notes servers. DYS' software took that information and turned it into a graphical

format, so it was much easier to understand the duration of replication cycles and delays between replications, assistant director Chris Gubanich said.

A typical Notes network consists of several servers; each contains local versions of the same database. These databases must constantly be synchronized with one another through Notes replication. As Notes installations scale up, adding users and servers, the ability to replicate databases gets harder, and some servers don't receive updates on time.

Notes offers help

Notes 4.0 from Cambridge, Mass.-based Lotus Development Corp. solves part of this problem by supporting symmetrical multiprocessing (SMP)-based servers. This lets hundreds of users run Notes off one server. Previous versions of Notes require hundreds of Notes servers for large installations, though it won't be

cheap for users to upgrade to high-powered SMP servers.

Going to fewer servers will make server-to-server replication "much less of an issue" than it

once was, said Alan Baren, IS manager at Coopers & Lybrand in New York.

But users still need a way to plan replication schedules, ensure

delivery of data and pull data from databases outside Notes.

"Typically, people want a little more insight into when replication occurs, mainly lengths and setup times," said Matt Cain, an analyst at Meta Group, Inc. in Stamford, Conn.

DYS' Analyzer provides detailed analysis of replication performance and recommends ways users can set up a better replication schedule or change the architecture of the servers involved.

For its part, Technology Investments, a consultancy in Tampa, Fla., uses IBM's MQSeries messaging architecture in its Notes product. Adaptive Replication Engine 2.0 pulls Notes data into MQSeries and delivers the replication as a message, guaranteeing delivery even if the target server is down at the time.

Other products, including Casahl Technology's Replic-Action 3.0, make it easier to transfer data among Notes and outside sources such as relational databases, analysts said.

A replica for success?		
Some third-party products that address replication issues with Lotus Notes		
COMPANY	PRODUCT	USE
DYS Analytics	Analyzer	Provides statistics for improving Notes replication schedules
Technology Investments	Adaptive Replication Engine 2.0	Uses IBM's MQSeries messaging middleware to ensure safe delivery of data updates
Casahl Technology	Replic-Action 3.0	Replicates with outside relational databases
Percussion Software	Notrix	Relational database integration

How safe is your E-mail? See Managing, page 69.

Lotus advances with its Win 95 'approach'

by Jeffrey Gordon Angus

Technology managers have to look at desktop database programs as two different tools: something for end users and something to program for integrating applications enterprise-wide.

Lotus Development Corp.'s newest version of its Windows database, Approach 96, adds features that position it to do both jobs. The key advances Lotus sought to make in the new 32-bit version were better execution speed, improved integration with Notes and usability advances. The designers aced the first two goals and got mixed results on the third.

Surprisingly, operational speed is improved in many areas when compared with the Windows 3.1 version, something that seldom happens when programs gain features. In exchange, however, Approach's documentation, already too thin in the prior version, has actually shrunk. Because Lotus loaded Approach 96 with new features, it begged a manual that describes more, not less.

The 32-bit version is faster in almost every respect. This is most noticeable in the areas where Approach's performance al-

Angus, page 42



IBM eyes piecemeal backups

No more down time: Notes 4.0 users can do on-line backups

By Craig Stedman

IBM this week will detail plans for letting users back up Notes 4.0 databases without bringing the whole works down.

The plans revolve around its ADSM storage management software, which does backups to mainframes and other servers. With this method, ADSM users will be able to do piecemeal backups of OS/2-based Notes 4.0 databases without giving up access to the files.

The on-line backup capabilities are scheduled to ship at the end of March for ADSM, which stands for Adestar Distributed Storage Manager. Support for Notes 4.0 — the version of the workgroup software from Lotus Development Corp. that ships this month — is being added to a backup package that IBM shipped last fall for earlier Notes releases.

Early users said the ability to limit incremental backups to recently changed files removes time

and network bandwidth roadblocks that stand in the way of Notes backups.

"We can't backup 4G bytes of data from 50 Notes servers each and every night. It's just too much for the network to handle," said Paul Beck, a systems engineer at Manassas Systems Integration Corp. in Manassas, Va. Beck is installing ADSM with the Notes backup agent at an unidentified U.S. government agency.

Some of the agency's Notes servers "don't even get backed up every week, and that's just an untenable situation" because Notes has become a key repository for data, Beck said. The backup agent went into use in late December on 10 Notes servers after IBM ended an initial limit of backing up 50 databases per server.

Servantis Systems, Inc., a maker of financial software in Norcross, Ga., has only two Notes servers and can comfortably fit backups into the graveyard shift. But any problems force the com-

pany to get its Notes administrator out of bed, said Michael Slay, a senior systems programmer. Incremental backups during the day would "let him sleep more often."

For OS/2 only

One drawback is that customers who run Notes on servers other than OS/2 are out of luck for now. Denise Christopher, ADSM product marketing manager at IBM, said a Windows NT version of the backup agent is being developed. But she wouldn't say when it would be available.

"I have a hard time convincing people here that continuous incremental backups are safe. But the less you have to back up in a given swoop, the less impact there is on the network," said Peter Ray, lead technical specialist at Valero Energy Corp. in San Antonio. Valero is testing the Notes backup agent on a single server.

Training Notes 4.0 users involves a lot. See page 59.

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Software

Antivirus product overcomes limitations of virus scanner

By Gary H. Anthes

Virus scanners, the popular approach to protection against computer viruses, have at least two drawbacks: They have to be updated frequently or they may not detect the latest viruses, and users have to remember to run them.

But NoMore #!\$ Viruses, a product from RG Software Systems, Inc. in Scottsdale, Ariz., was designed to overcome these limitations. The \$89.95 antivirus product runs transparently each time a PC is booted up, so users don't have to remember to run anything. The product doesn't rely on the unique signature left by each virus, so it doesn't have to be updated, the company claims.

NoMore #!\$ Viruses, pronounced "No more blankety-

blank viruses," immunizes PCs against "boot-sector" viruses, or viruses that hide in a disk's boot sector and are loaded as the computer boots up. These viruses normally are spread when users inadvertently boot up from an infected floppy disk.

The company claims that boot-sector viruses account for 90% of all infections. But because the product doesn't detect file-infectors or macro viruses, users still should employ traditional scanners for detection and removal of those types of viruses.

The Illinois Department of Revenue in Springfield is evaluating the product and may install it on about 300 mobile PCs, said Dennis Evans, public service administrator. "I installed it on my [386-based computer] without a hitch," he said. "I tested it with a few

common viruses, and it caught all of them."

Extra protection

Evans said the product is especially attractive because it runs automatically and transparently. He said it will provide an extra measure of protection when users fail to use a virus scanner on diskettes that contain new software.

The antivirus product installs itself as the first line in the CONFIG.SYS and AUTOEXEC.BAT files, so it executes before any other code is loaded. At boot-up, it compares the boot-up record with a previous snapshot and notes any changes. It deletes itself from memory after it runs.

A reviewer for the "Virus Bulletin," an industry newsletter in Oxfordshire, England, tested the product on 11 boot-sector viruses

and found that it detected and removed all of them. It then restored the hard disk by using information that was saved by the product when it was installed. "The result is impressive — a 100% hit rate," the reviewer reported.

Richard Ford, a computer virus expert at the National Computer Security Association in Carlisle, Pa., said he hadn't tested the product but that it is based on sound principles. "If you had a machine which was exposed to a

very high risk — say one in a university computer room, or a communal office machine — it's ideal," he said.

Ford said one drawback is that the product works after a virus has infected the PC, so it isn't a replacement for traditional techniques. "If you happened to infect your machine with Michelangelo on the trigger day, the product wouldn't stop you [from] losing all your data," he said. "Any other day, and the product should remove the virus."

Top viruses

Of some 6,000 known computer viruses, the following were reported most often during a recent month:

VIRUS	PERCENTAGE OF ALL REPORTED OCCURRENCES
Form	11.2%
Parity.Boot	10.4%
AntiEXE.A	9.1%
Concept	8.5%
Empire.Monkey	5.6%
Ripper	5.3%

Source: Virus Bulletin, Abingdon, Oxfordshire, England

Angus

CONTINUED FROM PAGE 39

ready was adequate — in searches and sorts. The slowness (sometimes glacial) of all Windows databases seems to be a result of their inherent object-oriented design. Therefore, slowness is most likely in screen display and refresh of complex compound objects, such as graphically rich forms and reports.

In testing identical forms and reports in Approach 3.0 under Windows 3.1 vs. Approach 96 under Windows 95, the new version ran noticeably faster.

The tighter ties between Approach and Notes are achieved with new functions that allow users to build applications that draw data from both sources. This includes Open Database Connectivity-compliant databases as well as Notes. From there, the data can be joined into single or multiple

forms and reports. And you can embed an Approach application in a Notes form.

There's OLE 2 support, but the main glue that holds this scheme together is LotusScript, a Basic-like language that works across multiple Lotus products.

The usability advances are uneven, though mostly positive. New "Assistants" (like wizards) take you through linear, step-by-step tasks to produce reports, charts and crosstabs. A new set of Summary functions make reports and crosstabs highly useful. Crosstabs still don't always work the way you expect.

The crosstab function in this version either has a bug or an undocumented limitation that prevents more than five summary columns. And in some cases, it insists on placing columns in the exact reverse order of what you specified in the Assistant.

Overall, though, these new capabilities make these functions more useful than they are in any

other Windows database I've seen.

The program now includes "named finds," which are selection-and-sort specifications you save under a name to reuse later. And you can access these from a

Windows 95-standard Action Bar. Once you have developed specifications and trained users to use them, end users can render these features for themselves.

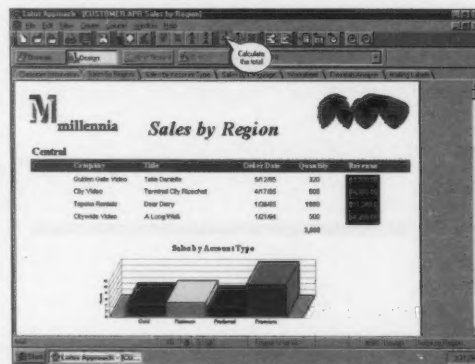
A Lotus-standard feature — SmartMasters — finally arrived in

Approach 96. These prebuilt, modifiable templates for common applications (sales contacts, inventory and so on) are somewhat useful as foundations for your own efforts, but they would be more useful if some had default data in them.

As an end-user tool for ad hoc creation of data management applications, Approach 96 is a better tool than previous versions. It also is better than Microsoft's Access, although not as easy to use as more focused end-user products such as Claris Corp.'s FileMaker.

As a professional tool for creating applications, Approach 96 has greatly improved. It now equals Access, though users of DataEase International, Inc.'s DataEase and SuperBase, Inc.'s SuperBase won't be rushing to change. No other database can better integrate with Notes.

Angus is a systems analyst and consultant at The Data Works Ltd. in Seattle.



Lotus' Approach 96 uses Assistants to help users easily create charts and other documents

Briefs

Hogan acquisition

The Continuum Co. in Austin, Texas, announced plans to acquire Hogan Systems, Inc. The \$230 million stock deal would unite two of the leading developers of banking and financial services software.

C++ for the Mac

Microsoft Corp. in Redmond, Wash., is shipping an upgrade of its Visual C++ that allows applications written for Windows to be ported to the Macintosh without major changes.

The \$1,999 Visual C++ 4.0 Cross-Development Edition for Macintosh includes code libraries that mimic the Windows 32-

bit programming interfaces on the Macintosh and adds support for OLE object architecture and the ODBC interface.

Sybase ships tools

Sybase, Inc. in Emeryville, Calif., recently began shipping Version 11 of its SQL Monitor and SQL Manager administration tools, which it said permit

more granular examination and adjustment of the SQL Server 11 relational database management system. Because of their published application programming interface, the new versions also are the first to let other vendors' tools monitor SQL Server 11 without affecting its operation. The products work with Versions 4.92, 10 and 11 of SQL

Server. SQL Monitor costs \$2,500 per server; SQL Manager costs \$1,500 per server.

Legent sale complete

Computer Associates International, Inc. has completed the sale of Legent Corp.'s information technology division to Pathlore Software Corp. in Columbus, Ohio.

PowerBuilder 5.0 joins OCX camp

By Frank Hayes

Powersoft Corp. has put one more piece in place for its massive overhaul of the PowerBuilder development environment.

When PowerBuilder 5.0 arrives later this year, users will be able to use Microsoft Corp. Visual Basic-style components alongside PowerBuilder's drag-and-drop components.

Components are prebuilt pieces of software that developers can drag into place with a mouse. They provide functions such as data access without writing any code.

And to make sure the components users want are available, officials at Powersoft's parent company, Sybase, Inc., earlier this month said Sybase will acquire

Visual Components, Inc. in Lenexa, Kan., for \$28 million in stock. Visual Components will become a division of Powersoft in Concord, Mass.

The move will extend the range of components PowerBuilder developers can use to build applications, but it may simply be icing on the cake for many PowerBuilder developers.

"Our programmers haven't complained about a lack of PowerBuilder components," said Janet Cain, chief information officer at the Minnesota Pollution Control Agency in St. Paul, Minn.

But the new components,

Under construction

PowerBuilder 5.0, currently in beta testing, adds the following capabilities to the product:

- Support for OLE components, which are provided by many industry vendors
- Partitioning applications between machines to help reduce the size of the client code
- Compiled code for improved speed

known as OLE controls (OCX), may be necessary for PowerBuilder 5.0, which will support applications that are split among multiple computers, said Alan Levin, principal at Decision Support Technology, Inc., a Power-

Builder value-added reseller in Cambridge, Mass.

"They're jumping to three-tier client/server, distributed environments, compiled code — lots of new things" that will require better communication among components, Levin said.

Powersoft has long included components with PowerBuilder. Other vendors also offer PowerBuilder-compatible components. But PowerBuilder has never been able to use OCXs, which communicate through the OLE system built into Windows. OLE technology allows desktop applications to be launched from within other appli-

cations and provides a common interface for the applications.

Popular visual development environments, such as Visual Basic, Gupta Corp.'s SQLWindows and Borland International, Inc.'s Delphi, have standardized on OCXs, which are available from hundreds of vendors.

Big splash

Powersoft hasn't indicated which, if any, of the components might be bundled with PowerBuilder 5.0, but users said they expect that to be the case. "They probably want to make a splash by including a bunch of OCXs with it," said Leo Tohl, a systems analyst at the CBORD Group in Ithaca, N.Y. "That's something that can really enhance the PowerBuilder environment."

Salsa serves up database objects

Users can pick from a menu and then create an 'outline'

By Stuart J. Johnston

From now on, when someone says they have Salsa, you may not need to get the corn chips and beer. That is because Salsa is the name of an object-oriented database development tool for end users.

The tool, which includes predefined classes of objects, was created by Wall Data, Inc. in Seattle.

Wall Data until now has been known as a vendor of PC-to-mainframe connectivity software. But where the company's Rumba provides access to data on mainframes, Salsa provides access to local data, officials said.

Roger Peterson, director of information systems at Kawasaki Motors Corp. in Irvine, Calif., said his group recently used Salsa to replace an outdated mainframe-

based time-reporting application.

"Salsa does a lot better job than anything else I've seen," Peterson said.

The package simplifies application construction.

Instead of laboriously defining tables, relationships and keys, the developer builds a model of the application by choosing prebuilt objects from a menu and arranging them on the computer screen in a

manner similar to creating an outline.

The objects reflect real-world data with which the user is already familiar, said David Kroenke, chief technologist at Wall Data.

For example, an object named "Employee" might contain data fields such as employee name, employee number, mail stop, company division, telephone number,

pay code, skill code and hire date.

"That whole approach is a lot more intuitive than anything I've seen," Peterson said.

"This is a vast departure" from other database tools because it lets users "view data the way you want to see it, not the way some programmer wants you to," said Andrew Seybold, editor in chief of "The Outlook," an industry newsletter in Boulder Creek, Calif.

How it works

Under the hood, Salsa assembles a sophisticated application that uses a SQL-based relational database engine.

When the user is finished with the model, he can click on a mouse button to automatically generate the application

code. Applications are created as pseudocode, which is interpreted at runtime.

Database tools "usually require that you learn a lot about normalizing data and relational technology, but Salsa hides all of that under the covers," said Jean S. Bozman, research manager at International Data Corp. in Mountain View, Calif.

Salsa for the Desktop is avail-

able to some existing customers and will be generally released by the end of March, said Kris Kelsay, marketing manager for the product.

The package is a 16-bit Windows application and runs under Windows 3.1 or Windows 95.

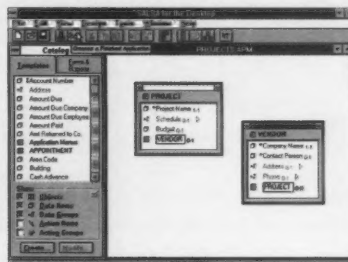
It requires 8M bytes of RAM and 30M bytes of free hard-disk space. A 32-bit Windows 95 and Windows NT version is under way and is due by the end of the year, officials said.

Salsa for the Desktop is available for a special price of \$149 per copy; the company said it will raise the price to \$499 at an unspecified later date.

Each user of a Salsa application needs a copy of the program.

Salsa for the Desktop comes with three sets of prebuilt objects and sample models called Starter Kits. Additional kits cost \$49 each.

Database development



Salsa for the Desktop lets users build applications by choosing prebuilt objects and arranging them on-screen. Users then can generate application code with the click of a mouse button.

TECA, Inc. has introduced Custom Controls for AS/400, a set of controls for Microsoft Corp.'s Visual Basic.

According to the Portland, Ore., company, Custom Controls for AS/400 is a set of Visual Basic custom controls (VBX) that lets users develop IBM AS/400 client/server applications without providing low-level coding.

Custom Controls for AS/400 lets client/server developers set the properties of each control and use Visual Basic's Rapid Application Development environment to connect to the AS/400.

It includes an INI/VBX that allows "no code" access to custom configuration values stored in private INI files. All Custom Control VBXs can be used in Visual Basic's design mode and don't require an active connection to the AS/400.

Pricing for Custom Controls

for AS/400 starts at \$395.

► **TECA**
(503) 761-9438

MetaSolv Software, Inc. has introduced PowerFrame Framework Library 3.0, an add-on tool for Powersoft Corp.'s PowerBuilder.

According to the Dallas company, PowerFrame Framework Library 3.0 gives developers a skeletal framework on which to develop applications. The product features Quick Start Application

Generator, a skeleton project library file with application objects, frames, menus and .INI files. It also has a message manager that standardizes error and information messages and can manage multiple transaction errors.

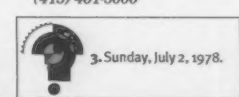
PowerFrame Framework Library 3.0 costs \$395 per developer. Site licenses are available.

► **MetaSolv Software**
(214) 239-0623

Synon Corp. has introduced Odyssey 2.0, a client/server devel-

opment environment. It has tools, business-object class libraries and application-generation capabilities for developing PC LAN applications. It also incorporates Windows clients or IBM AS/400 5250 terminals with AS/400 servers. Pricing starts at \$8,750 per seat.

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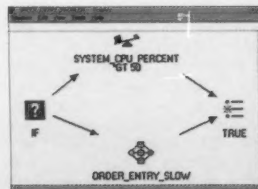
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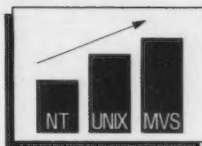
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WEEK 1 OF 19

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1. Hypertext pioneer and author Ted Nelson is the son of what famous actress?
2. What was Borland's internal pre-release name for their Quattro spreadsheet?
3. On what date did *The New York Times* switch from hot type to computerized typesetting?
4. What supercomputer is featured in the movie *Jurassic Park*?
5. How long would it take to send the entire Encyclopaedia Britannica over a 2-gigabit fiber-optic cable?

Trivia questions and answers provided and/or verified by Christopher Morgan and The Computer Museum.

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Question #	Correct Answer on Page #
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2.	
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1. Look for the COMPUTERWORLD TechnoTrivia icon  to find the answers (planted throughout this issue) to the TechnoTrivia questions listed on this page.
2. Enter via COMPUTERWORLD's Web site on the Internet: <http://www.computerworld.com>
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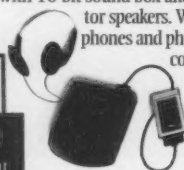
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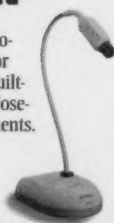


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Each Tuesday five winners and their associates (up to 20 people) will receive Dunkin' Donuts gift certificates for 3 dozen donuts, a Dunkin' Donuts coffee thermos, a pound of ground coffee plus an engraved TechnoTrivia plaque.



Please pass along this issue of COMPUTERWORLD to an associate after you have finished playing the game.

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The Enterprise Network

LANs • WANs • NETWORK MANAGEMENT

47

The Enterprise Network

Capacity spurs Ethernet switch

Increase in vendors slashes cost of ports

By Bob Wallace

The switch is on. Information systems managers across the country and around the world are switching from their shared-capacity Ethernet LANs and Token Ring LANs to Ethernet switching, which is inexpensive and gives end users dedicated bandwidth.

This is analogous to the shift in residential telephone use from party lines to private phone lines.

"[The move to] switching is a capacity issue," said Blair Sanders, a senior member of the technical staff at Texas Instruments, Inc. in Dallas. "With switching, you get a dedicated 10M, 16M or 100M bit/sec. of capacity per port as opposed to having to share those amounts [among] many users."

Ethernet switching is the hottest segment of the LAN switching market; it has grown from \$100 million in the third quarter of 1994 to \$349 million in the third quarter last year, according to the Dell'Oro Group in Menlo Park, Calif.

The number of Ethernet switch vendors has swelled, which is good news for users because it has sent the price of Ethernet switch ports plummeting. A port cost more than \$700 a few years ago; one port and a few switches costs less than \$100 today.

User nod

Token Ring switching also is gaining user acceptance, but more slowly than Ethernet switching. That is because 10M bit/sec. Ethernets run out of bandwidth before 16M bit/sec. Token Ring networks. That isn't to say vendors are dragging their feet with Token Ring switching. In the past few months, IBM, Bay Networks, Inc., Madge Networks, Inc., Standard Microsystems Corp. and start-ups Nashoba Networks, Inc. and Xylan Corp. have shipped Token Ring switches.

The price per Token Ring switch port still is high, which has steered many Token Ring users

toward Ethernet switching, but that trend will slow in the coming years. Fiber Distributed Data Interface switching has shown steady, but not explosive, growth.



Making connections

A router determines where data is sent in a corporate network. A hub connects multiple end users. A switch connects hubs and/or individual users in an enterprise network.

The following user case studies show how companies use switching in their production networks to enhance or change the way they do business.

Speed, scalability is in their court ...

L.A. Law may have had Jimmy Smits and Susan Dey, but Fish and Richardson has switching.

The 118-year-old Boston law firm in August boosted its bandwidth by replacing Ethernet and Token Ring LANs with Ethernet switches from 3Com Corp.

Document imaging and other high-bandwidth applications, coupled with the high cost of Token Ring adapters, prompted the move to switching, said Ian Steward, director of information systems at Fish and Richardson.

"Eighty percent of our employees are on the network at any given time," Steward said of his firm's nationwide network.

"None can afford to wait for information. Our goal was to deliver speed and scalability to our desktops for everything from imaging and document retrieval to [elec-

tronic mail] — and that's what we got."

The 3Com switches operate 10 times faster than the old networking equipment and for half the price, he said, which highlights the advantages of switching. The LinkBuilder 1000 switches provide 100M bit/sec. connections to the firm's six Intel Corp. Pentium-based servers that run Novell, Inc.'s NetWare, two backup servers and a Microsoft Corp. Windows NT server that will be installed this month.

Information sharing

The network serves as the foundation for a document management application, which lets teams of geographically dispersed attorneys share data from any location.

"The network lets every attorney access, update and return any server-based document no matter where that server resides," Steward said. "Long term, we plan to migrate to shared — and eventually dedicated — [Asynchronous Transfer Mode] to the desktop," Steward said. — Bob Wallace

... Network performance has special effect

The digital effects pioneer that brought you the slick action scenes in the movie *Braveheart* couldn't have done it without Ethernet switching.

R. Greenberg Associates, Inc. (R/GA) used digital special effects — and Ethernet switching — to make it seem as if a few horses galloping toward a castle were a herd of horses running into wooden spikes.

The digital chicanery was prompted by animal rights activists and horse lovers who wouldn't have stood for the mauling of the animals for the movie.

The firm left behind most of its shared-capacity Ethernet LANs to move aggressively into the nascent digital effects industry.

Bandwidth boost

Creating very high-resolution images and adding animation can take up hundreds of megabytes of data, which was too much for the company's shared-capacity Ethernets to handle.

So R/GA went with Ethernet switching from Cabletron Systems, Inc.'s Multimedia Access Center (MMAC) chassis hub.

"We wanted to give our animators better network performance so that they

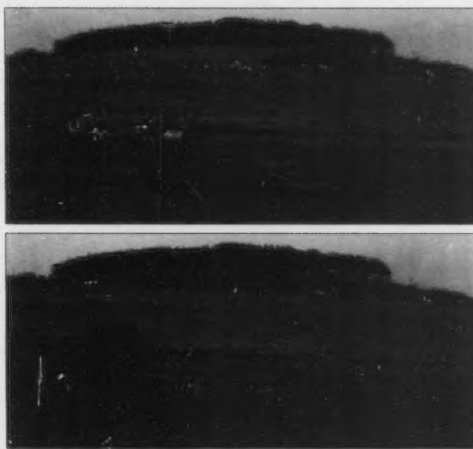
wouldn't even have to think about the network," recalled Joe Katz, systems manager at R/GA in New York.

The remaining Ethernet LANs are linked to the MMAC's backplane, which at R/GA serves as a high-speed backbone network. "Many small and separate Ethernets had sprung up in different departments and had to be linked," Katz said.

R/GA has had a hand in more than 2,000 commercials — including one that features dancing Shell Oil pumps and another in which a baby struts around the kitchen floor with Edy's frozen yogurt — and more than 300 films. It used Ethernet switching to deliver up to 10M bit/sec. of dedicated bandwidth to each workstation.

R/GA also is implementing 155M bit/sec. Asynchronous Transfer Mode switching for animators' desktops as part of a \$200,000 upgrade project.

— Bob Wallace



Switched digital special effects brought *Braveheart* into the picture. They also doubled the size of the army the character faces and removed crew members.

The Enterprise Network

Users look for time of day from Novell

NetWare shops seek help with time-synchronization task

By Laura DiDio

The adage "Do not squander time; for that's the stuff life is made of" is taking on new meaning in large NetWare 4.x shops.

Time synchronization is the ability to maintain the same time across servers and the computers that are attached to them. It is needed to record the time that system events occur — but the ability to do this consistently seems to confound even savvy network administrators.

One such user posted a general query on CompuServe's Netwire forum recently that asked for advice from "anyone who's had any experience" with network time-synchronization devices. The user, who requested anonymity, said his company was starting to add NetWare 4.x servers and wanted "to set up a reliable time-synchronization system before we get too far along."

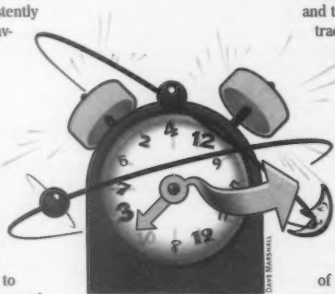
Help wanted

He isn't alone. Users have recently posted a steady stream of technical inquiries on the Novell, Inc.-sponsored Netwire forum and on Novell's World Wide Web page.

Netwire sysop Doug Archell,

who runs independent consulting firm DJA Systems in Pickering, Ontario, said synchronization can help network administrators determine which version of a file or an application software package is the latest.

Lack of time synchronization can impede or wreck a network's ability to perform routine functions such as scheduling daily



backups. In a worst-case scenario, NetWare servers that are out of sync can crash the network.

The problem can affect any large shop with many servers that may or may not be geographically distributed.

But time synchronization is particularly challenging in NetWare 4.x, because of the NetWare Di-

Define it

Time synchronization is the facility in a network operating system that maintains the same time across multiple servers.

rectory Services (NDS) database.

NDS manages multiple NetWare 4.x servers simultaneously, and time stamps are used to keep track of changes to NDS objects. To work together, all servers must keep the same time, with a configurable margin of error that is "defined in milliseconds," Archell said.

Replication

Pieces of the NDS database can be stored on a local server, but copies of those portions also may be stored on one or more remote servers.

When information in the local database is updated, those updates must be propagated to the remote servers that store copies of the database information. It is vital that the changes be made in the correct order.

The most important thing a NetWare user can do to avoid time synchronization problems is

to plan, according to Archell and Marcus Williamson, a fellow Netwire sysop.

"Make sure you know what links are in place, how many servers are on your network, how many networks are on the inter-network — and that all the time zones are configured properly," Archell said.

Novell has made two Time Synchronization Application Notes

available to NetWare users. They are Time Synchronization in NetWare 4.x (November 1993) and Time in the NetWare Environment (January 1994). Both are available for free downloading via CompuServe's NOVLIB forum.

Users also can access the TIMESG.TXT file in the NetWare 4.x Library forum for a listing of third-party, time-synchronization software utilities.

A brief history of time

NDS' time synchronization feature uses four types of time servers to standardize time:

- **A single reference server.** When this is used, it is the only source of time. All other servers must be secondary servers.
- **Primary servers** that negotiate, or "vote," with other primary servers to determine the time.
- **Secondary servers** that receive the time from a primary or single reference server and give it to client PCs.
- **Reference servers** that are used with primary servers and are usually deployed with a hardware or remote time source.

For each NetWare server,

the administrator must define basic time-synchronization information by creating a TIMESYNC.CFG file on the server with the following information:

- **The time server type.** This is usually the primary, reference or secondary server.
- **The time sources** that will be used to receive the time.
- **The time zone** the server is located in.

Netwire sysop Doug Archell advises firms with a custom configuration to create a TIMESYNC.CFG file for each server. This file is in the server's SYS:SYSTEM directory. The file comprises two parts — Parameters and Time Sources. — Laura DiDio

Monitors emerge to diagnose backbones

Rmon troubleshooters gain support for Fiber Distributed Data Interface links

By Patrick Dryden

Users of Rmon probes and software will at last be able to peer in to their high-speed backbones, as Rmon vendors add this capability to their products.

New support for Fiber Distributed Data Interface (FDDI) links among campus LANs lets managers or troubleshooters track transactions completely between clients and servers.

Remote Monitoring (Rmon) users haven't been able to monitor historical usage and gather traffic statistics from their FDDI backbones as they have from probes on their Ethernet and Token Ring LANs.

Armon Networking, Inc. in Santa Barbara, Calif., recently introduced FDDI options for its OnSite line, and Hewlett-Packard Co. in Palo Alto, Calif., began shipping

its FDDI LanProbe last month. Frontier Software Development, Inc. in Chelmsford, Mass., led the way with NETscout support for FDDI, which was released last summer.

"We definitely need to monitor our FDDI backbone the same way we do our Ethernet segments," said Barry Stanton, senior network analyst at Advanced Micro Devices, Inc. in Austin, Texas.

AMD's 7,500-node network spans 13 buildings and is vital to the firm's manufacturing processes and design engineers, among other things, Stanton said. "For us, Rmon stands for Reliably Maintaining Our Network. We need remote packet capture from the backbone [and] the LANs to [ensure] availability," he said.

Users who have realized the benefits of Rmon need consistent activity reports across their networks, but "FDDI backbones have been a black hole in the middle," said Tim Wilson, management analyst at Decisys, Inc., a network consultancy in Sterling, Va.

"They can't judge exactly where a slowdown occurs if the FDDI backbone isn't performing at peak efficiency," Wilson said.

"It's a blind spot in their overall troubleshooting capability."

Tools of the future

In the future, these FDDI options could be important tools that will let administrators watch all spans of their networks, said Tom Bain, a research analyst at Meta Group,

Inc. in Westport, Conn.

But right now, most users are still figuring out which LANs should be monitored with Rmon tools so they can avoid paying too much for probes and getting overwhelmed by statistics, Bain said.

Users haven't been without help troubleshooting FDDI links among LANs and to servers. Protocol analyzers help them watch traffic, read embedded management statistics and capture packets if FDDI backbones demonstrate unexpected behavior.

Analyzers are "fire-fighting tools [that are] used about 5% of the time," said Andy Belcher, operations manager at HP's Net-Matrix division.

But Rmon probes show trends over time and the impact of applications, such as backbone utilization from users who browse the

"We definitely need to monitor our FDDI backbone the same way we do our Ethernet segments."

Barry Stanton, senior network analyst, Advanced Micro Devices

World Wide Web, he said.

Now Rmon support provides remote and historical monitoring, which can help administrators understand baseline performance and discern changes that could indicate backbone problems in the path of the client/server interaction.



Network monitoring

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The Internet

WORLD WIDE WEB • INTRANETS • ON-LINE SERVICES

Delta Web site gets its wings

By Kim S. Nash

A fly on the wall would have heard some lively debate at the early meetings Delta Air Lines, Inc. held to discuss ideas for its first World Wide Web site.

First, there was the sticky decision about which relational database to use behind the on-line scenes: Would it be an Informix Corp., Oracle Corp. or Sybase, Inc. database?

Oracle's recent displacement of Sybase as the corporate standard at the Atlanta-based air carrier answered that question—but only after Oracle battled fiercely with Informix for the honor [CW, July 3 and CW, Dec. 18].

New ground

The more difficult decision was how to link the Oracle database, which was chock-full of flight schedules and other handy internal information, to the Web site.

"There were lots of deci-

sions to be made, and not all of them were no-brainers. Like everyone else [building Web applications], we're getting into new ground," said Mark Kraieski. He is a senior manager of internetworking services at Transquest, Inc. in Atlanta, an independent company that is half-owned by Delta. It handles the airline's information systems.

Delta launched a set of Web pages Jan. 2 (<http://www.delta-air.com>) after about six months of designing and building.

Delta hasn't set any land speed records; its rivals American Airlines, Inc. and UAL Corp.'s United Air Lines unveiled Web sites before Delta did (<http://www.amr.com> and <http://www.ual.com>, respectively).

Delta has taken the easy route for now. The company has started with somewhat simpler services instead of go-

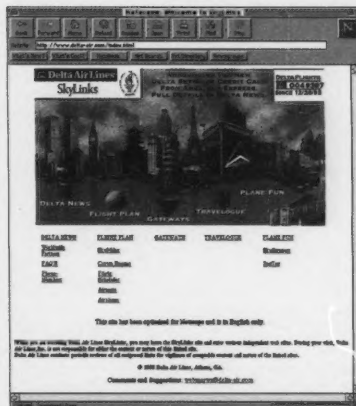
ing to John Ragals, an account manager at Modem Media, Inc. in Atlanta. The consulting firm helped design Delta's Web site.

The second phase of the project will likely include user access to Delta's SkyMiles frequent-flyer data, Ragals said. Work on the second phase should be under way by late March, he added.

However, Delta's Web development methods may provide at least one lesson for other IS professionals who plan to build Web applications. For example, Delta carefully isolated its Web applications from its production systems for two reasons, Kraieski said.

"We didn't want anything on the inside to go down and have it impact Web users," he explained.

And performance was a concern. Delta had no clear idea of how much traffic its Web site would field and didn't want to risk bogging down internal production applications with an overload of outside users, Kraieski added.



After about six months of design and build time, Delta launched a set of Web pages Jan. 2

ing full throttle with every cybernation that it would like to offer Internet users.

The site provides access to relatively static information,

the site, Kraieski said.

United, meanwhile, offers on-line electronic ticketing—something Delta will work on in the coming months, accord-

On-line heavies chase 'net

Services strive to shake off proprietary nature

By Mitch Wagner

Even as membership booms, on-line services are in a mad scramble to make themselves more compatible with the Internet. They fear their proprietary software may otherwise make them go the way of the Amiga.

The major on-line services—America Online, CompuServe, Prodigy and The Microsoft Network (MSN)—already offer access to the Internet and the World Wide Web.

This year, the services are broadening their Internet offerings. They will add products and convert their content to Hypertext Markup Language (HTML), the language of the Web, so the content can

be moved effortlessly between the Web and the proprietary on-line offerings.

"We're heading that way as fast as possible," said David Bezaire, director of Internet products at CompuServe, Inc.

in Columbus, Ohio. "We've recognized that for the delivery of an on-line service, you need Internet access."

CompuServe plans to convert its content to HTML later

On-line services, page 54

Racking up the numbers

On-line service grew 79% from 1994 to 1995

Total 1995 on-line subscriptions - 11.3 million

America Online 4.5 MILLION

CompuServe 4 MILLION

Prodigy 1.6 MILLION

Microsoft Network 600,000

Delphi 125,000

EWORLD 125,000

Source: BRP Publications, Inc., Washington

Briefs

Support via 'net

A Brazilian vendor of mainframe compression and terminal-emulation software is pulling out of the U.S. market. But that doesn't phase at least one U.S. user. Octus Informatica in Belo Horizonte, Brazil, lost a \$1 million contract back home and is pulling out of nondomestic markets to cut its operating expenses.

"Who cares where they are located physically?" said Reg Hargrove, vice president of sales at Decision Support, Inc. The software vendor in Matthews, N.C., is one of about 40 Octus users in the U.S. "It's just a matter of being able to reach

them by Internet, or by fax or [telephone] if necessary."

InSoft delivers 'net tool

A new development environment from InSoft, Inc. lets users combine whiteboard, chat tool, desktop videoconferencing and multimedia development functions over the Internet. A server module manages the different multimedia and telephony capabilities, while multimedia applications created with the tool kit can be plugged in to the other services. Prices for modules of the Internet Collaborative Environment range from \$49 to \$759.

The Internet

Microsoft releases Web-friendly apps for Mac

By Lisa Picarille
SAN FRANCISCO

Just a little over a month after detailing how the Internet will play a key role in its applications strategy, Microsoft Corp. is already showing off two new Internet components for its best-selling Macintosh applications.

At the Macworld Expo held here earlier this month, Microsoft offered a glimpse of its Internet Assistant 2.0 for Microsoft Word for the Macintosh and its Internet Explorer World Wide Web browser for the Macintosh.

Revenue boost

Microsoft is the largest application developer for the Macintosh. In fiscal 1995, more than \$380 million of Microsoft's total revenue of \$5.9 billion was generated from sales of Macintosh software.

Users also can take advantage of familiar features in Word, including AutoFormat and AutoCorrect, when creating HTML documents. And they can directly view and edit HTML source code.

In beta testing now and due out later this quarter, the program lets users create hyperlinks within documents and then toggle between the newly created HTML documents and a Web browser.

One user of Word for the Macintosh said these capabilities dramatically simplify the ability to create HTML documents that are to be posted on the Internet or a company intranet.

Although it isn't the only option for Macintosh or Word users, Microsoft's approach simplifies the process by letting users press a single button to enact the conversion process.

"I'm not a programmer, and I don't know how to program in

HTML," said Mitch Hollander, a research scientist at the Food and Drug Administration in Billerica, Mass. "So this lets me use Word, which I have been using for years, to easily create documents that can be put up on the Web or posted on our internal Web site."

Industry watchers agreed, noting that Microsoft is the dominant player in the Macintosh word processing market, with more than 80% of the market.

Deja vu

"The Internet Assistant provides users with a familiar environment and feature set to author and format documents for the Internet," said Pieter Hartsook, editor of the "Hartsook Letter," an industry newsletter in Alameda, Calif. "That is a real advantage for users."

Redmond, Wash.-based Microsoft also lifted the curtain on a second product, the Internet Explorer for the Macintosh. The program, also due out later this quarter, gives users direct access to the Web from within Microsoft Office for the Macintosh.

Mac attack

Two pieces of Microsoft's Macintosh Internet strategy are in beta testing and will be available this quarter. Users will be able to download the products for free from Microsoft's Web site.

INTERNET ASSISTANT 2.0 FOR MICROSOFT WORD FOR THE MACINTOSH

- Creates and edits HTML documents from within Word 6.01 for the Macintosh
- Creates hyperlinks
- Creates Internet and intranet forms
- Lets users view and edit HTML source code
- Gives users ability to toggle between Web browser and HTML documents

INTERNET EXPLORER FOR THE MACINTOSH

- Gives users direct access to the Web from Microsoft Office for the Macintosh
- Can establish and manage bookmarks
- Lets users print Web pages from Office for the Macintosh

New features

Internet Assistant 2.0 for the Macintosh lets users create and edit Hypertext Markup Language (HTML) documents from within Word 6.01 for the Macintosh by automatically converting Word files to HTML format.

Like other browsers, Explorer for the Macintosh offers the ability to establish and manage bookmarks as well as print Web pages directly from within Office for the Macintosh.

Most users already have a Web browser, but users of Office for the Macintosh said the tight integration into applications they use every day makes it even easier to get on the Web, Hollander says.

Snapshot

Internet census: Who's surfing and how?

A recent study claims there are 9.5 million Internet users, lower than a previous estimate of 20 million or more. Here's what the 'net users are up to:

Adults who use the Internet for business and personal activities:	60%
Those who used their first Internet application last year:	51%
Users who access the Internet through an on-line service:	46%
Users who said TV viewing declined as a result of Internet usage:	32%

Source: Find/SVP, New York.

On-line

CONTINUED FROM PAGE 53

this year. Prodigy Services, Inc., started last June, and America Online, Inc. has its own Internet service provider in a separate on-line offering, the Global Network Navigator, which also has a Web page (<http://www.gnn.com>).

The rush for change comes despite 15% growth in the six months ended last September. At that time, there were 9.5 million users, according to multimedia analysts at BRP Publications, Inc. in Washington.

So why is change a good thing? The answer is simple: The Inter-

net is cheaper and available to more users. Big corporate users can get Internet access almost for free as a sideline to their TCP/IP business networks.

San Diego Gas & Electric Co. put its site on the Web because it can reach Internet users as well as all the on-line service users. On an on-line service, the site would have reached only customers of that service. "We would be excluding a great number of people," said Ed Van Herik, who heads up Internet access at the utility.

AT&T Corp. announced plans early this month to shut down the Interchange on-line service it had acquired for \$50 million a year ago. AT&T's portion of Inter-

change, the AT&T Business Network, will move onto the Web within a year. The company hopes its business partners, which include Gartner Group, Inc. in Stamford, Conn., and the Washington Post Co. in Washington, will follow by early 1997.

The AT&T announcement follows a decision by Microsoft Corp. to move a substantial amount of content off its fledgling MSN — less than five months after its launch — onto a new MSN home page (<http://www.msn.com>).



5. Two seconds.

Blue Squirrel, Inc. has introduced SqURL Plus, a World Wide Web search engine.

According to the Salt Lake City company, SqURL Plus lets Internet users unify several search engines.

SqURL Plus was designed to speed searches and eliminate duplication.

It was also designed to run on an unattended basis. This lets users schedule Web searches to run

as often as they choose.

The product includes a feature that lets users download pages from the Internet for off-line browsing.

SqURL Plus costs \$60. The product can be purchased at the company's home page at <http://www.bluesquirrel.com>.

► **Blue Squirrel**
(801) 484-2225

FRX Software Corp. has introduced FRX Enterprise 5.0 for Windows.

According to the Denver company, FRX Enterprise 5.0 for Win-

dows is a 32-bit, Internet-enabled financial reporting product.

It features server-based processing to handle corporate databases, a report manager with Internet distribution, on-line analytical processing and Internet-based multicurrency consolidations.

FRX Enterprise 5.0 for Windows includes a data repository that was designed to let companies link the product to any accounting system.

It also has direct interfaces to many accounting systems, including systems from Great Plains

Software, Inc., Solomon Software, Inc. and Macola, Inc.

Pricing for FRX Enterprise 5.0 for Windows starts at \$15,000.

► **FRX Software**
(303) 741-0900

On Technology Corp. has introduced IPTrack, a product for simplifying the management of Internet Protocol addresses.

According to the Cambridge, Mass., company, IPTrack is a Novell, Inc. NetWare Loadable Module that provides central IP address management by implementing Dynamic Host Config-

uration Protocol, a TCP/IP protocol. IPTrack was designed to automate NetWare administration tasks, including assigning IP addresses, maintaining logs of address assignments, tracking addresses of workstations that have been moved and troubleshooting IP address conflicts.

IPTrack supports NetWare 3.11, NetWare 4.x under bindery services and NetWare Directory Services, and Class A, B and C internetworks. Pricing starts at \$995 for 50 IP addresses.

► **On Technology**
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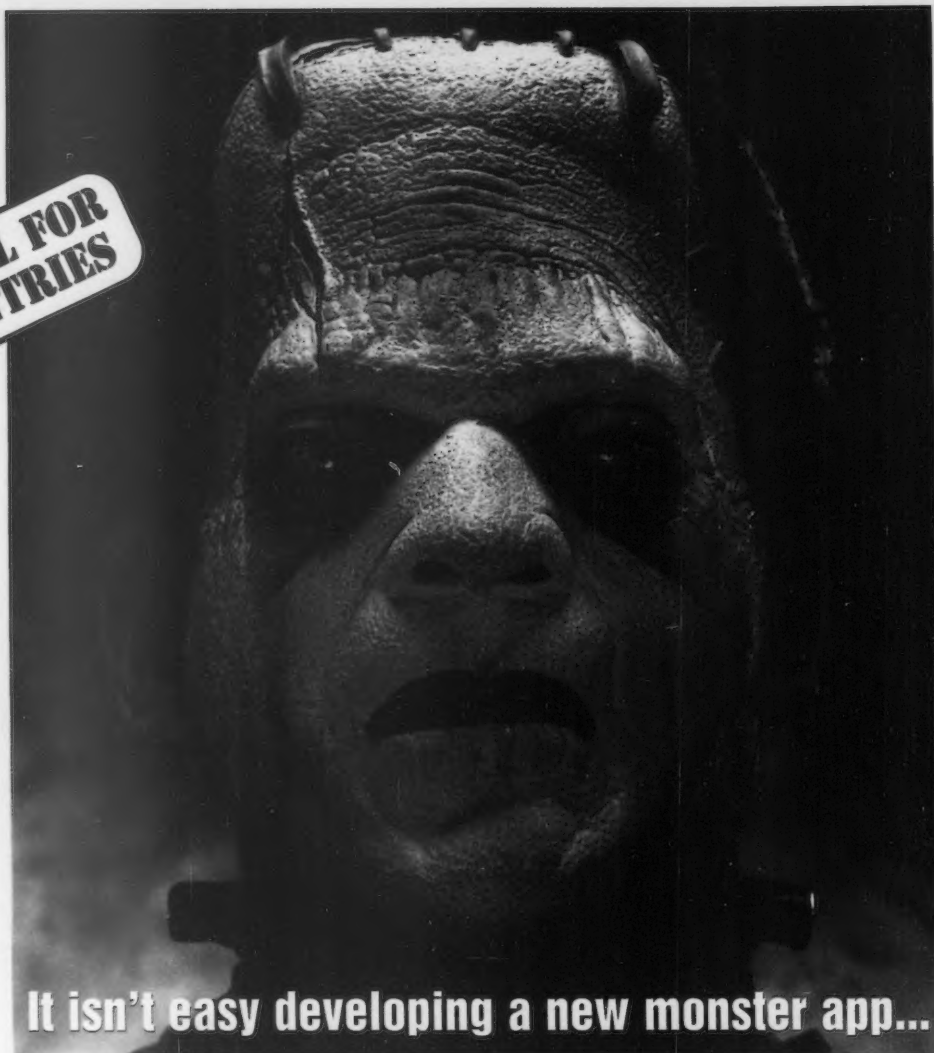
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CASE STUDIES • TRENDS • OUTSOURCING

Getting the most from groupware investments

By Tim Ouellette

Users have to learn how to share if they want to use groupware.

That will be one of the main messages delivered this week at Lotusphere in Orlando, Fla., where the new features of the Notes 4.0 up-

grade will get lots of scrutiny. But information systems shops installing or upgrading to Version 4.0 had better know how to explain the software to regular users too.

"If you don't get past the idea of sharing, then you really won't be able to take advantage of groupware," said Tim M. Crawford, information access manager for Notes at National Semiconductor Corp. in Santa Clara, Calif.

Tip of the iceberg

"Almost 80% of the cost of a Notes installation is support, management and training — not the software," said Jeff Held, a partner at Ernst & Young's Technology Services Practice in New York. "People fail to understand that, and they get blindsided."

Lotus training providers and Notes users agree that groupware training requires users to first understand how Notes can help information sharing and then how that information sharing will help the business process.

"The hard part is to educate people how to think about this kind of tool beyond the fact that you push this button to do that," said Steve Weissman, president of Kinetic Information in Waltham, Mass.

For example, Business Evolution, Inc. is introducing GroupFocus, a Notes training tool kit that requires users to solve problems as a team using the features of Notes rather than just learning how to get through the program. The Princeton, N.J., firm reviewed the quality of previous training programs for Notes, especially in companies where the groupware wasn't used much after installation.

"The power of groupware or the expectations of the organiza-

tions from the implementation was never fully explained or demonstrated," said P. V. Kannan, a principal at Business Evolution. He recommended having executives clarify the goals of the software before training begins.

At Ernst & Young, for instance, the chairman sent a memo to employees explaining why the company was moving to Notes, Held said.

Training

To provide examples of how to use Notes — especially with the slew of new features available in the product — some companies plan to have Notes applications up

and running from the start.

"We didn't just install Notes" for the last upgrade, said John Hodge, chief information officer at NAC Reinsurance Corp. in Greenwich, Conn. "We went out and developed seven applications, which were all totally different uses of Notes," so users could dig in.

A mix of training options is good, users and trainers agreed.

At National Semiconductor, some courses were outsourced, and some were created internally to give the company flexibility in the types of classes available to

Taking good Notes


A mix of training approaches is recommended for Notes 4.0. Some providers are listed below.

COMPANY	TRAINING
Lotus' Education Group North Reading, Mass.	Training with a focus on group tasks
Business Evolution Princeton, N.J.	Notes 4.0 team-learning tool kit
ReCor Evanston, Ill.	Network-based training for Notes 4.0
Stream International Westwood, Mass.	Notes training programs
CBI Systems San Francisco	Computer-based training for Notes 4.0
Infomage Workgroup University Phoenix	Notes classroom training

users, Crawford said.

"If you really want to do it right, I don't think you can stick to one method of teaching people," said Robert Burton, an instructional designer at ReCor Corp. in Ev-

anston, Ill. "Companies that I have seen with minimum problems do a little of each."

 IBM eyes piecemeal backups. See page 39.

Freightliner delivers client/server payload

By Stuart J. Johnston

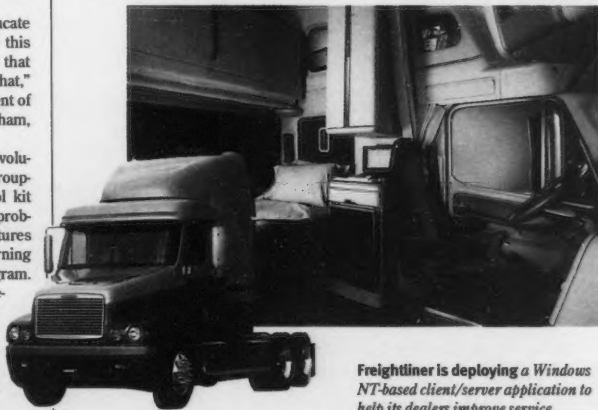
When an 18-wheeler blows by you on the freeway, you're probably not thinking about client/server computing. But if that semi is a Freightliner, maybe you should be.

That is because Portland, Ore.-based Freightliner Corp. is deploying a service-order application built on Windows NT. The goal is to help the company's independent dealers improve the quality of their repair

and maintenance services. Freightliner, the largest manufacturer of heavy trucks in the U.S., is a wholly owned subsidiary of Mercedes-Benz MBGH.

The application, called ServicePro Advisor, is just the latest in a family of systems designed to automate dealership tasks and the second to move to a client/server setup at Freightliner, said Rob Hassell, the company's general manager of MIS.

Freightliner, page 63



Freightliner is deploying a Windows NT-based client/server application to help its dealers improve service

Survey says: Certify, certify

By Julia King

If your aim is to operate more sophisticated and efficient client/server-based information systems, hire certified IS professionals or pay to certify your current staff.

So concludes a study by International Data Corp. (IDC) in Framingham, Mass., which surveyed more than 250 IS managers about the benefits — or more accurately, the perceived benefits — of employing certified IS professionals.

Certified staffers study a formal curriculum and then pass a test. The curriculum and the test are developed by the vendor sponsoring the certification program, such as Novell, Inc.'s Certified NetWare Engineer, or CNE, program.

"Most companies support certification and see value in it, but very few try to quantify its value," explained Rebecca Segal, director of Services Industry Consulting at IDC. Instead, "they have a gut feel" about the value of certification, she said.

Benefits are big

Nonetheless, Segal said IDC uncovered several key findings, all of which indicate that certification greatly bolsters the effectiveness of client/server environments. The main benefit is certified staffers' increased expertise in a particular technology.

The study was sponsored by several vendors with certification programs, including Lotus Development Corp., Microsoft Corp., Sybase, Inc. and IBM.

Companies that support certification are more likely to use advanced desktop applications, including Windows and Notes, the survey indicated. They are also more likely to widely distribute their computing resources.

Additionally, the study found that 78% of IS managers

Certify, page 63

Five Ways

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the world's most successful
companies. And we can do
it for you. Here's how:



Dr. James H. Goodnight
President, SAS Institute Inc.

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Corporate Strategies

Esprit alters the fit of its outsourcing

Clothier gives more tasks to outsourcer at project midpoint

By Thomas Hoffman

Many companies fail to appreciate the complexities of switching from centralized mainframe to client/server computing until they're hip-deep in these projects.

At Esprit de Corp., however, a midcourse correction in its ambitious client/server plans led to a selective outsourcing deal that is expected to save money and a good deal of staff angst.

"Esprit is not a technology-driven company, and I was not able to afford an MIS staff with significant depth at different skill sets," said Peter Hanelt, chief operating officer at the \$300 million apparel maker.

The missing skill sets included

distributed database management and Unix expertise. So Esprit decided last month to expand its outsourcing arrangement with Software Maintenance Specialists (SMS) in Santa Ana, Calif.

With the estimated \$15 million, five-year extension, the SMS contract now includes installation of client/server hardware and software, network management and application development.

SMS will now support a select group of Esprit's information systems operations in several client/server initiatives over the next few years. That support includes the rollout of an electronic data interchange order fulfillment system with retailers and an IBM RS/6000-based retail manage-

ment system from Montreal-based Richter & Associates.

The San Francisco-based women's and children's clothing wholesaler began working with SMS in October 1994 to outsource its legacy processing.

By expanding the outsourcing deal, Esprit expects to reduce its client/server initiation costs by several hundred thousand dollars over the next five years.

"The outsourcing arrangement gives us the ability to ramp up and ramp down on [personnel] resources when needed," explained Chuck Bell, director of

systems applications at Esprit.

The move also should enable Esprit to meet its original four-year plan, which the company wasn't meeting on its own. In addition, the outsourcing relationship should enable Esprit to tackle its client/server projects faster than if it hired outside contractors to handle each independent phase, Hanelt said.

Esprit's 25 IS staffers were picked up by SMS to support the selective outsourcing functions. Hanelt declined to discuss how much the client/server project cost.

The deal makes sense for Esprit because it allows the compa-

ny to retain strategic control over its client/server migration while enabling it to off-load nonessential activities such as equipment installation to SMS.

Esprit's approach also maps with industry trends. "It's a great strategy. User companies can shorten their time of implementation and get accountability from these vendors," said Allie Young, a senior analyst at Dataquest Worldwide Services Group in Westboro, Mass.

Efficiency is particularly important for Esprit and other players in the women's apparel industry, where profit margins continue to get squeezed.

"In these difficult times, retailers are looking for greater performance from their wholesalers," Hanelt said. "Therefore, we have to continue to focus our attention on our customers' needs and outsource where it makes sense."

ESPRIT



Esprit's Peter Hanelt: *"I was not able to afford an MIS staff with significant depth at different skill sets"*

GIS helps curb oil spill damage

State wildlife agency used geographic information system to salvage habitats

By Michael Goldberg

After an estimated 2,000 gallons of oil spilled from a broken pipeline into McGrath Lake in Southern California, Randy Imai reached for his workstation keyboard in Sacramento.

With reports from the field, Imai, an environmental specialist at the California Department of Fish & Game, entered the location of the December 1994 spill in to the agency's geographic information system (GIS) to gauge the effects the spill might have on vegetation and wildlife habitats.

the state's marine areas. A major component of the five-year, \$6.4 million program was funding a GIS system for the Department of Fish & Game to graphically catalog sensitive marine areas and wildlife populations around the state.

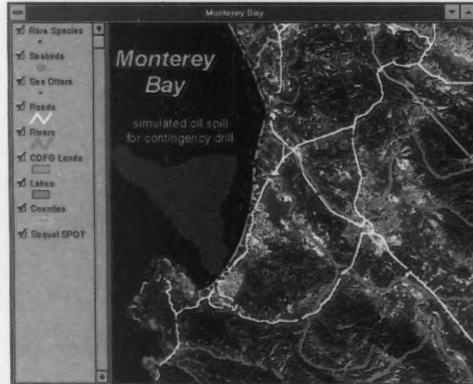
The agency uses the Arc/Info GIS software from Environmental Systems Research Institute, Inc. (ESRI), which runs on Unix-based HP 9000 workstations from Hewlett-Packard Co.

The setup includes a data center in Sacramento, where the agency is installing an HP 9000 Model K100

server to host the GIS system, along with three branch sites and one portable workstation to take on the road.

John Ellison, GIS manager at the department, said the IS program has meant trimming 12 jobs from the department's payroll, for an estimated \$467,000 in annual savings. Because of the GIS system, biologists were no longer needed to track down data from agency records.

Scott Nelson, a research director at Gartner Group, Inc. in Stamford, Conn., said government agencies have been leaders in



The California Department of Fish & Game was able to gauge the effects an oil spill had on vegetation and wildlife habitats with its GIS

geographical systems technology. The recent development of specialized GIS products for retailers, for example, makes the market ripe for rapid growth.

Unix workstations from HP and Sun Microsystems, Inc. are the most popular now, but this could change with the advent of more powerful systems running Windows NT, Nelson said. Software vendor ESRI is the leader among high-end spatial displays on workstations, he added.

During the Lake McGrath incident, Imai's Office of Oil Spill Prevention and Response told the dis-

patched veterinarians to watch for gulls, grebes and brown pelicans, which frequented the area. Later plans called for replanting native plants to replenish the environment around the lake. In all, the agency's response was a generation removed from the sketch pad and map books of the past, Imai said.

"This technology grabs that information from a database with lots of numbers and tables and displays it on a map. You can visualize; you can see, here are the red dots which represent a sensitive area," he said.

Briefs

Hot developers

Oracle Corp. in Redwood Shores, Calif., said the ranks of experienced Oracle application developers will swell by "hundreds" as a result of its recent signing with two global integration partners — Coopers & Lybrand in West Hartford, Conn., and Dallas-based SHL, formerly SHL Systemhouse, Inc. Sales of Oracle applications have increased by more than 100% per quarter for the past four quarters, thus increasing demand for Oracle consultants, who last year earned as much as \$200 an hour.

Bank of America signs deal

San Francisco-based Bank of America has signed a seven-year technology services outsourcing contract with Integrated Systems Solutions Corp. The two firms said the deal is a renewal of a contract Bank of America assumed through its 1994 merger with Continental Bank. ISSC manages mainframe operations, application development, desktop services and business recovery services at Bank of America's Illinois technology center.

Freightliner's client/server payload

CONTINUED FROM PAGE 59

He declined to talk about the project's costs.

Freightliner plans to move new applications to client/server, Hassell said. That will enable the IS department to use off-the-shelf products such as Microsoft Corp.'s Windows NT, SQL Server and SNA Server.

ServicePro Advisor is being rolled out to the company's nearly 300 dealerships, and almost 40% of them — about 135 — are up and running already, Hassell said. The other dealerships will get the application this year. Installation of additional ServicePro modules will begin in a couple of months (see story at right).

Easy access

ServicePro Advisor lets dealerships access information about the standard repair times for Freightliner trucks as well as service bulletins or recall notices on truck parts, according to Emile Beaudry, vice president of Edmonton Freightliner. The independent dealership in Edmonton, Alberta, is running the

system in pilot mode.

ServicePro Advisor also enables a service writer (the person in the service department who writes up a repair order) to do a preliminary diagnosis of the customer's problem.

Improved customer service

The ServicePro applications aim to improve customer service and increase dealerships' absorption rates. The absorption rate represents the percentage of a truck dealership's fixed costs that can be covered by sales of parts and service. This can be critical when truck sales are slow.

Time-saver

The application prompts the service writer and customer with a series of questions that help home in on problems. This saves time and enables the dealer to "fix it right the first time," Beaudry said.

"The service writer can say to the technician, 'Here's the problem and, by the way, there's a service bulletin out on it,'" Beaudry said.

ServicePro Advisor also provides access to Amdahl Corp. mainframe-based parts inventory and warranty-tracking systems.

For example, the service writer might take the customer's information and a description of the problem and link that with the truck's service history in ServicePro. If the service work is covered under the truck's warranty, ServicePro Ad-

ServicePro Technician helps diagnose problems in trucks

The same team that developed Freightliner's ServicePro Advisor has created a second module called ServicePro Technician, which will provide a direct link to computerized diagnostic systems in the company's trucks.

The systems, called Data Logging units, are built in Freightliner's newest truck line, the Century Class. Existing trucks can be retrofitted with some of the diagnostic capabilities, said Rob Hassell, general manager of the company's IS group.

The data reflecting the truck's "health" can be quickly downloaded to ServicePro Technician by hooking a

special service cart that contains a built-in "industrially hardened" PC to the truck's data port.

Data from the truck's electronics system is then sent to the ServicePro system via a wireless IBM LAN from the cart.

One dealership is already running a pilot of ServicePro Technician, and Freightliner will begin deploying it when it deploys ServicePro Advisor in the next few months, Hassell said.

Another future component will add scheduling capabilities designed to enable a large service shop to manage 24-hour, seven-day scheduling operations.

— Stuart J. Johnston

visor will obtain the necessary information from the warranty system.

Once the problem is identified, the service writer can quickly identify the parts needed using the PartsPro system, a client/server application Freightliner deployed previously. PartsPro will check the dealership's inventory and then, if necessary, Freightliner's mainframe-based parts inventory system in Portland.

Revenue enhancer

The system can also display discount specials, giving the service writer an opportunity to offer those to customers. This enables dealerships to bring in added revenue that is critical during periods when new trucks are selling slowly, ac-

cording to Hassell.

However, Hassell and Beaudry said measuring productivity gains for ServicePro Advisor is more difficult than with other systems.

"It's made the technician's job easier and served the customer better, but it hasn't made the service writer's job any less hectic," Beaudry said.

Freightliner's IS group is deploying ServicePro Advisor in concert with IBM and other resellers. Microsoft Consulting Services (MCS) provided overall project management and used Portland-area third-party developers to build the application. ServicePro Advisor took about a year to develop, said Mark Heaton, managing consultant at MCS.

Certified IS professionals key

CONTINUED FROM PAGE 59

ers who favor certification feel that certified employees are more productive — albeit more expensive — than their noncertified counterparts.

A certified employee costs about \$9,500 more per year than a noncertified employee, according to IDC. The figure is based on an average cost of \$3,728 for training and testing and a pay differential of 11.7% between certified and noncertified employees.

Lyondell Petrochemical Co. in Houston migrated from a pure mainframe environment to a system of networked PCs running Microsoft applications in less than two years. Its 12 certified help desk staffers support a user base of more than 1,200.

"I'm not convinced

we could have supported those customers without certification," said Ron Sovargue, who managed the Lyondell support group until last year.

"Certification helped focus all team members, who could also use all the same training materials and set up buddy sys-

tems to train," he explained.

As a result, Sovargue said he is implementing a similar certification program in Microsoft technology and Novell's NetWare network operating system at Frontier Information Technologies, Inc., a telecommunications company in Rochester, N.Y.

He now manages Frontier's 50-person help desk operation, which supports about 6,000 users nationwide.

Some dissent

But not all IS managers are enthusiastic about certification.

"Personally, I don't put a whole lot of stock in certification. I still find that just because people have a CNE certification, they don't have [the] down-and-dirty experience. It's all

book-learned," said Frank Petersmark, senior systems manager of technical support at The Amerisure Cos. in Southfield, Mich.

"I would rather sit down and talk with someone for an hour or so about their technical capabilities," he added.

Paid to learn

The following certification programs are the most popular for IS

- Novell Certified NetWare Engineer
- Novell Certified Network Administrator
- Microsoft Certified Systems Engineer
- Lotus Notes Certified Consultant
- Certified IBM OS/2 and LAN Server Engineer

Source: International Data Corp., Framingham, Mass.

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Managing

Intranets

WHAT DOES THIS NEW THREAD IN THE WEB PORTEND FOR IS? MANAGERS SPEAK OUT

By Roger L. Kay

Safe behind their firewalls, information systems departments are putting up "intranets" — internal corporate networks equipped with World Wide Web technology.

Corporate giants are finding that Web technology may be better suited to their distributed computing needs than conventional network architectures. This discovery will have a major effect on IS departments in the next two to three years. Are big layoffs in store? Some top IS manag-

ers say yes; others say no. Are there career opportunities in webmastery? You bet! But IS personnel will need to be more business-focused than ever.

IS managers say it's still too early to predict how the Web will affect the shape of their organizations. But they have begun to formulate views about what skills their staffs will need. These managers' own words best describe their take on the rise of internal webs:

On the types of skills required in an intranet world:

Pat Fortune

Corporate vice president of information technology and chief information officer
Monsanto Co., St. Louis



"Web technology creates a need for a new hybrid IS/businessperson whose capability is focused on the content rather than the medium. Careers are there for the kind of people who can create Web applications and who can stay flexible enough to deal with this dynamic and changing environment.

"Some won't have these skills. But there's still a demand for traditional IS capacities. We will not be out of our legacy systems for a while, and there's also our client/server efforts."

David Sims

Technical manager, information technology
Schlumberger Ltd., New York

"The most fundamental skills will be a desire to learn and an ability to adopt new methods as it becomes generally accepted that Web technology brings organizational efficiencies."

Greg Cline

Director of network integration and management research
Business Research Group, Newton, Mass.

"The emergence of the departmental Web server starting [in] mid-1996 will affect the careers of information systems people in much the same way that the adoption of PC LANs did. In order to grab the baton as it's passed, IS folks need to develop a new set of skills. You don't need to be a heavy-duty programmer to do [Hypertext Markup Language]. Instead, you need a gener-

al understanding of how a formatting language like HTML works and the ability to cast knowledge elements such as text, graphics and sound bites in an understandable on-screen format.

"However, even knowledge of formatting languages will soon be passe as tools that allow you to generate content come on stream. When that happens, there will be no need to generate raw HTML files. The key skills will be the ability to use these tools and the creativity to structure knowledge so that it can be digested by the screenful. Smart IS professionals will volunteer for Web administration and take the opportunity to cross-train."

On the likely fate of Notes:

Joe Crawly

Senior administrator of on-line services and webmaster
AMR Corp., Dallas

"AMR also has Notes advocates. Different sectors are trying to sell internal users on different platforms.



**ARE MIDDLE MANAGERS THE KEEPERS OF
CORPORATE KNOWLEDGE? A NEW BOOK
SAYS YES. PAGE 72.**

Management is listening to everybody — as long as they're paying their bills. But I foresee Notes losing users to Web technology.

On early intranet applications:

Art McArnarney

Senior staff programmer/
analyst
Lockheed Martin Enterprise
Information Systems, Orlando,
Fla.



"We're putting up our policies and procedures first — these are the documents we use every day to do business, and they're top priority."

Cline:

"While it's more difficult to predict which vertical industries, other than high tech itself, will be early adopters, some of the first horizontal applications will be in corporate research libraries. Personnel also finds the Web an attractive way to increase communications with employees about corporate events and benefits — and go paperless."

Anonymous

Electronic commerce staff member
Fortune 100 company

"Our first applications are likely to be for internal information posting — something that a small number of administrative people post to and that a large number of employees read. For now, our web is intended as an information source, not an information exchange. We largely use E-mail for that. We will probably not use Web technology as a backup for E-mail. Although with-

Many IS managers say the net effect of the changing mix of skill requirements on employment will be fairly minimal. Not so, says the webmaster at one of the largest U.S. corporations. In this person's opinion, Web technology will facilitate large IS staff reductions.

"We're right at the final period of a major restructuring of the IS organization," says the webmaster, who requested anonymity. "The new organization is already designed, and we're cutting a lot of folks, picking up Web technology and inserting it into the organization. Forty percent of the staff will be cut. It's not all Web-related, but the Web is a major piece of how we're going to do more with less. We have 20 Web applications that tie in customers going up now, and Web technology is going to play a key role on the inside, too."

in two or three years, you may not care because there may be effective integration among technologies that now look discrete. Maybe in a couple of years, there won't be that big a difference between Web services, file sharing and E-mail."

On the advantages of Web technology:

Sims:

"The ability to work from wherever you happen to be is very efficient. An electronic way of doing business is a cultural issue within a company, and it doesn't happen quickly. But when it does, you really can't argue with the improvements in efficiency and communications."

"In our case, with operations in about 90 countries around the world, on-line access to technical documentation that can be centrally updated in real time is infinitely less expensive and quicker than publishing technical manuals. IS staffing levels may decline as organizations become more efficient, but new opportunities for employment will open in the fields of technical support and information creation from data."

On life with Netscape Communications Corp.:

McArnarney:

"We're getting more and more involved. We have 176 Web servers, internal and external home pages and an average of 6,900 accesses per month. We've made 42,500 pages of information available on the internal web alone. But users must be connected to the corporate network. We have two levels of firewall to keep unauthorized users out of our internal network. Internally, however, Netscape has brought some of the fun back into programming. For example, we just put up a corporate phone directory that employees can call down to change their own phone numbers on-line. What we needed was a piece of software that ports and is robust and inexpensive. Because HTML source files are essentially text, Netscape just dances across Mac, Windows and Unix. Training isn't an issue. We put Netscape in front of a few people who had never used it and off they went."

On keeping it all in perspective:

Ted Julian

Research manager for Internet commerce
International Data Corp., Framingham, Mass.

"There are waves of excitement about any new technology, but the business still has work to do. Legacy systems may have no sex appeal whatsoever, but they keep the company rolling. People are stumbling along with systems that work. You can't say that of a Web solution. It's not evolved to that level yet. Web technology is highly appealing, but people should not get too caught up in it. A healthy dose of skepticism is still warranted. It's clear that the existence of legacy systems will slow Web adoption, and there are redundancy issues. You don't want multiple systems. As compelling as the new toys are, they have to work with your existing system, and everyone has some weird application that's mission critical and can't be replaced."

Kay is a freelance writer in Wayland, Mass. He can be reached at RLKay@world.std.com.



Debugging people in software development

Are software development projects delivering diminishing returns? During the late 1980s, the U.S. Department of Defense contracted with Carnegie Mellon University's Software Engineering Institute in Pittsburgh to develop a model to measure an organization's likelihood of finishing application development projects on time and on budget. Called the Capability Maturity Model, it was subsequently adopted by corporate giants such as Motorola, Inc. and Citibank NA.

"In software, however, people are the real critical resource," says Bill Curtis, chief scientist at TeraQuest, Inc. in Austin, Texas. He helped the institute develop the model. Curtis adapted the model to human resource development in the application development profession and named it the People Capability Maturity Model, or P-CMM. The P-CMM process guides organizations to reappraise existing human resource practices to identify core competencies, promote teamwork and encourage workers to continually improve their capabilities.

"Close parallel"

Released last September, P-CMM is about to start beta testing at Citibank's Tampa, Fla., Global Relationships business unit. "We found a close parallel between software maturity and people maturity levels," says Paul Garber, corporate technology human resource vice president. "The groups with the more mature software development approaches also invested more time in management, hardware and software, and teamwork training. Managers in those groups also believed that people should work more closely in teams," he says.

Garber admits that the findings aren't "rocket science." But he says the P-CMM process could help Citibank provide broader career and development opportunities. The pilot, scheduled for the first quarter of this year, will survey about 100 application development staffers, managers and human resource personnel. "We hope to get a complete snapshot of what needs to be improved," Garber says. — Tony Baer

F.Y.I., page 68

Compaq and IBM haven't decided whether to put **value**



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pricing ahead of features or vice versa.

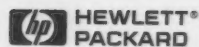
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February conferences

MANAGEMENT

Business Process and Workflow Conference. Orlando, Fla., Feb. 4-7 — Gideon Gartner kicks off his new consulting firm with an event that examines business process re-engineering issues. Most of the first day is devoted to optional tutorials that zero in on the process or more technical study.

Conference topics include re-engineering from the human perspective, standards and interoperability issues, measuring the benefits and return on investment of business process re-engineering, why business process re-engineering projects fail and integrating business and information technology organizations.

Fee: \$995-\$1,095. Contact: Giga Information Group, Norwell, Mass. (800) 874-9980.

Commerce in Cyberspace. New York, Feb. 6-7 — Joint sponsors The Conference Board and the U.S. Department of Commerce bill this as a "second-generation" event about commerce on the Internet.

The conference is relatively untechnical. Its intent is to help senior managers take advantage of the business environment the Internet is creating. One novelty is the show's hands-on session for computer-illiterate executives, where they can see the World Wide Web in action.

The agenda includes speakers from Eastman Kodak Co.; NBC Television; Time, Inc.; IBM; GE Information Systems, Inc.; and Mitre Corp. No shortage of corporate muscle here.

Contact: The Conference Board, New York, N.Y. (212) 339-0345.

Internal Auditing for Information Technology. Orlando, Fla., Feb. 6-7 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

Call Center '96. Dallas, Feb. 6-9 — This conference and exposition promises something for everyone, including telecommunications, networking and information systems managers; call center and telemarketing managers; database marketing; and service bureaus.

Contact: Registration Center, Duluth, Minn. (800) 331-5706.

Advanced Software Auditing. Orlando, Fla., Feb. 8-9 — Contact: Quality Assurance Institute, Orlando, Fla. (407) 363-1111.

INDUSTRIES

Food Marketing Institute (FMI) Distribution Conference. San Diego, Feb. 11-14 — Conference explores the information systems logistics of moving food products from warehouses to supermarkets. Contact: FMI, Washington, D.C. (202) 452-8444.

Marketing Financial Products and Services on the Internet. Chicago, Feb. 21-22 — This conference features a "net exploration session workshop, which seems to be catching on as more executives seek to find out what all the hubbub's about.

The bulk of the show is devoted to case studies on Web home pages, security, customer service and brokerage businesses, among others. Presenters include well-known industry names such as BayBank, The New England and Mellon Bank Corp.

Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

EDMS/PDM Spring '96 International User Forum. Houston, Feb. 26-29 — The event covers engineering document management systems (EDMS) and product data management (PDM). Contact: Kalthoff International, Cincinnati, Ohio (513) 794-3367.

Designing a Corporate University Learning Infrastructure: From Concept to Reality. Cambridge, Mass., Feb. 27-28 — Contact: Quality Dynamics, Inc., New York, N.Y. (800) 946-1210.

Computers in Libraries '96. Arlington, Va., Feb. 27-29 — Contact: Information Today, Inc., Medford, N.J. (609) 654-6266.

Call Center Management in Banking, Insurance and Financial Services. Atlanta, Feb. 29-March 1 — Contact: IBC USA Conferences, Inc., Southboro, Mass. (508) 481-6400.

USER GROUPS

Eighth Annual SURF Conference. Orlando, Fla., Feb. 4-8 — Presented by

the Sequent Users' Resource Forum (SURF). Speakers include Joe Head, founder of Optical Data Systems, Inc., and executives from Sequent Computer Systems, Inc. Contact: SURF, Beaverton, Ore. (800) 640-7873.

TECHNOLOGIES

Data Warehousing Conference. Orlando, Fla., Feb. 6-8 — Contact: Digital Consulting, Inc., Andover, Mass. (508) 470-3880.

Digital Wireless Technologies: Foundations for Network Success. Miami, Feb. 8-9 — Contact: ICM Conferences, Inc., Chicago, Ill. (312) 540-3860.

Software Architectures for the Year 2000. San Diego, Feb. 12-14 — Contact: Ashley Pearce, Gartner Group, Inc., Stamford, Conn. (800) 778-1997.

Uniform '96. San Francisco, Feb. 12-16 — This Hot Happening [CW, Nov. 20] is a key event for the Unix crowd. Peek at the latest cool boxes, get tips on integrating Windows with your open systems and learn about new technologies.

Speakers will include IBM's Lou Gerstner, Netscape Communications Corp.'s Jim Clark and Hewlett-Packard Co.'s Lew Platt.

Contact: Softbank Comdex, Inc., Needham, Mass. (617) 433-1500.

Networks Expo/Mactivity: The Macintosh Connectivity Conference (combined conferences). Boston, Feb. 13-15 — Contact: Blenheim Group, Fort Lee, N.J. (201) 346-1400.

Calendar announcements should be submitted at least six weeks prior to the event and include the title of the event, dates, location, theme or focus, keynote or major speakers, principal topics and a contact person, organization and phone number.

SEND ANNOUNCEMENTS TO:

Steve Ulfelder, Associate Editor/
Managing, Computerworld,
500 Old Connecticut Path,
Framingham, Mass. 01701.
Fax: (508) 875-8931.

CONTINUED FROM PAGE 65

E-mail security

How safe is your company's E-mail? "The CSI Manager's Guide to E-Mail Security," offered free by the San Francisco-based Computer Security Institute (CSI), aims to help answer this question. The booklet outlines some hazards presented by electronic mail (for instance, it serves as an entry point for viruses and imperils trade secrets) and suggests preventive measures.

The guide offers checklists, sample policies and a resource list to help information systems managers improve E-mail security and increase end users' awareness of the problem.

For a copy of the guide, call (415) 905-2310 or visit the CSI World Wide Web site: <http://www.gocsi.com>.

Getting the most from EDI

If you're implementing EDI only because customers are badgering you, you're probably on the wrong track. A study by the Industrial Technology Institute in Ann Arbor, Mich., found that the Top 2 reasons companies implement electronic data interchange (EDI) are pressure from customers and necessity imposed by just-in-time delivery. But these reasons — pressure from without rather than from within — are less likely to lead to a successful EDI program.

The survey of 255 small and medium-size manufacturers found companies that believe EDI will help internal efficiency benefit more than those that see EDI merely as a customer relations tool.

The Center for Electronic Commerce's Web site is: <http://www.itl.org/cec>.

Women in technology

An upcoming meeting aims to provide executive women the opportunity to discuss professional and personal issues.

The focus of this year's conference is "The Balancing Act: A Female Perspective on Leadership." Speakers include Carol Bartz, CEO at Autodesk, Inc., and Dawn Lepore, vice president and chief information officer at Charles Schwab & Co.

For more information, call Taylor Winfield Partners, Dallas, Texas (416) 593-1991.



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'Suit yourself', he says, tips his hat, and walks away.

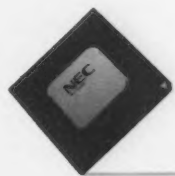
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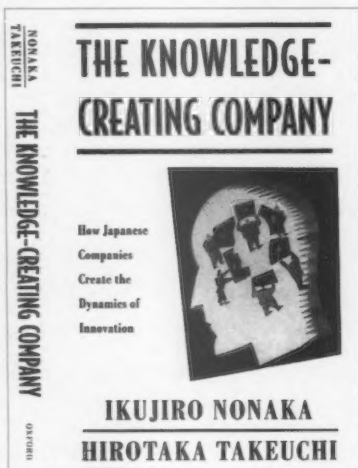
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Where IS cannot tread

Excited by knowledge management? Calm down! Two Japanese authors say there's a limit to what IS can contribute

By Rob Guth



**MIDDLE MANAGERS
ARE THE HEROES
OF A COMPANY'S
KNOWLEDGE
CREATION,
ACCORDING TO
NONAKA AND
TAKEUCHI**

In the late 1980s, Nissan Motor Co. dispatched 1,500 employees to Germany to experience the thrills of driving the autobahn. Speed limits not high enough back in Japan? Not quite. The employee visits were a way for Nissan designers to learn about Europe's driving culture and fold those insights into a car that was designed for the European market — the popular Nissan Primera, which debuted in 1990.

The Nissan story, which is detailed in the recent book *The Knowledge-Creating Company: How Japanese Companies Create the Dynamics of Innovation* (Oxford University Press, New York, 240 pages, \$25, hardcover), is an example of how Japanese companies "create new knowledge, disseminate it throughout the organization and embody it in products and services," say the book's authors, Ikujiro Nonaka and Hirotaka Takeuchi. They are professors at Japan's prestigious Hitotsubashi University outside Tokyo. The authors, who are well-known in the Japanese business community, wrote the book in English rather than Japanese to reach a global audience.

Does all this knowledge creation sound like a job for LANs, groupware and other so-called enablers? It's not. Most of the companies cited by the authors, including Matsushita Electric Industrial Co. and Honda Motor Co., achieved their innovations with scant use of information technology.

One reason is corporate Japan's dearth of information systems — networks, and for that matter PCs, have yet to reach most Japanese companies.

But more important, the authors say, Japanese companies can tap a hidden knowledge that isn't easily represented electronically.

"Creating knowledge involves a little bit of trial and error. It's knowledge that is gained through experience, converted into organizational knowledge and [isn't] as simple as putting data on a computer," Takeuchi says. "It runs counter to the American style of trying to communicate everything by [electronic mail]."

The authors label this experiential knowledge "tacit." It's the kind of knowledge the Nissan employees gleaned in Europe: hunches, personal knowledge and experiences, insights and intuitions. This is contrasted with "explicit knowledge," which can be described easily in facts and figures — the stuff Western companies love.

Knowledge management in the West has risen hand-in-hand with technologies such as groupware, whiteboarding and videoconferencing, but tacit knowledge is difficult to verbalize, represent digitally or store in a database. It is the stuff of metaphors and analogies and is better communicated face to face, the authors say.

How do you tap this fuzzy knowledge trapped in the minds of your workers? The answers may surprise, given that they lie partially in the stuff West-

ern re-engineering efforts have been driving out: waste, redundancy and middle managers.

Knowledge-creating companies rely on redundancy (of information and responsibilities, for instance) as a means of "encouraging frequent dialogue and communication" from which tacit knowledge can be converted to usable, explicit knowledge. Japanese companies often divide a product development team into groups that each devise a different approach to the same problem. The groups then argue over the advantages and disadvantages of each method.

Supermanagers

Middle managers are the heroes of a company's knowledge creation, according to Nonaka and Takeuchi. Yes, the same stratum held as the source of corporate inefficiency sits between front-line workers — those with useful reserves of tacit knowledge — and upper management. This is the layer in a company where knowledge creation occurs, the authors argue.

The role of the middle manager is to take the tacit knowledge of the workers closest to customers and markets and try to mesh it with the knowledge and broad business goals coming from above. Middle managers mediate between the "what should be" of upper management and the "what is" of the real world.

These strategies served Japan well through the 1980s, but the country today has some reassessment to do as it rapidly tries to improve white-collar productivity through information systems. Nonaka admits: "The weakness of the Japanese is they rely on tacit knowledge too much. They love it, but experiential knowledge is time-consuming and costly." That may not float well in a country mired in a protracted recession and looking for leaner ways of doing business. ■

Guth is Tokyo correspondent for the IDG News Service.



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In Depth

Good-bye, legacy skills

By Thomas Hoffman

For some programmers, it's like boot camp. For others, it's an adrenaline rush. One thing's for certain in the move from legacy to object-oriented skills: The experience is never ho-hum.

For Thomas Duck, it was like boot camp — 10 weeks of intensive technical training, seven hours a day. Then Duck would tuck on another five hours at the office to keep up with his regular workload.

By the time Duck crawled home at night, his 3-year-old son and newborn daughter already were fast asleep. Oh, how he missed his wife and children. He would think of them often during his long, grueling training regimen.

But it didn't stop there. Before collapsing into a heap, Duck would change clothes and drag his weary body out jogging in the dark. He had picked one heck of a time to prepare for his first 10-kilometer road race.

"It was very difficult. My wife and kids didn't much appreciate it," says Duck, 35.

"It" was Duck's journey into object-oriented programming from his roots in legacy systems.

In April 1994, Duck and nine other hand-picked recruits at Skyway Freight Systems, Inc. were selected to participate in a 10-week program to learn Next, Inc.'s NextStep application programming language. The Watsonville, Calif.-based transportation systems company decided to move to object-based programming as it began re-engineering its core processes, such as claims processing.

Duck and most of the programmers who were chosen for the NextStep group came from legacy programming backgrounds, having spent the better part of their careers using languages such as Basic, Cobol and Pascal.

Frustration factor

Skyway's soon-to-be NextStep programmers were frustrated at first. "It takes time to grasp this technology because it's different from anything you've been taught before," says David Moore. The 30-year-old's bachelorhood wasn't compromised as much as Duck's marriage and family life were during NextStep training. Still, the long days of training and overtime did cut down on his evenings. "I wasn't going out as much as I would have liked," Moore says.

Hoffman is *Computerworld's* senior editor of IS management.

Eric Westlund, a project manager who trained on the object technology, admits he felt a little dumb at times, especially "when we had to learn those damn memory pointers."

Despite these irritations, object-based programming came fairly naturally to these programmers.

Westlund didn't have much trouble embracing the new mind-set associated with object programming. Instead, the biggest challenge for him was using C — a language he considered "low-level" — to implement NextStep objects. Westlund was used to the higher-level Basic.

For example, it often requires more effort to add an element to an array in C than it does in Basic, Westlund says.

The Skyway developers chosen for the NextStep training were titillated by the challenges that lay ahead of them. To most of them, it was an opportunity to program as the software gods had intended — by reusing code and objects and linking them to one another through a building-block approach.

"To me, object programming is not something new
Object-oriented challenge, page 76



◆ There was a rift between the new object programmers and the legacy programmers, says IS manager Brian Hyland (front). But managers are trying to ease tensions with projects that combine object technology with Basic and Cobol. Also pictured (left to right): David Moore, Kevin Koyne and Thomas Duck, object programmers.

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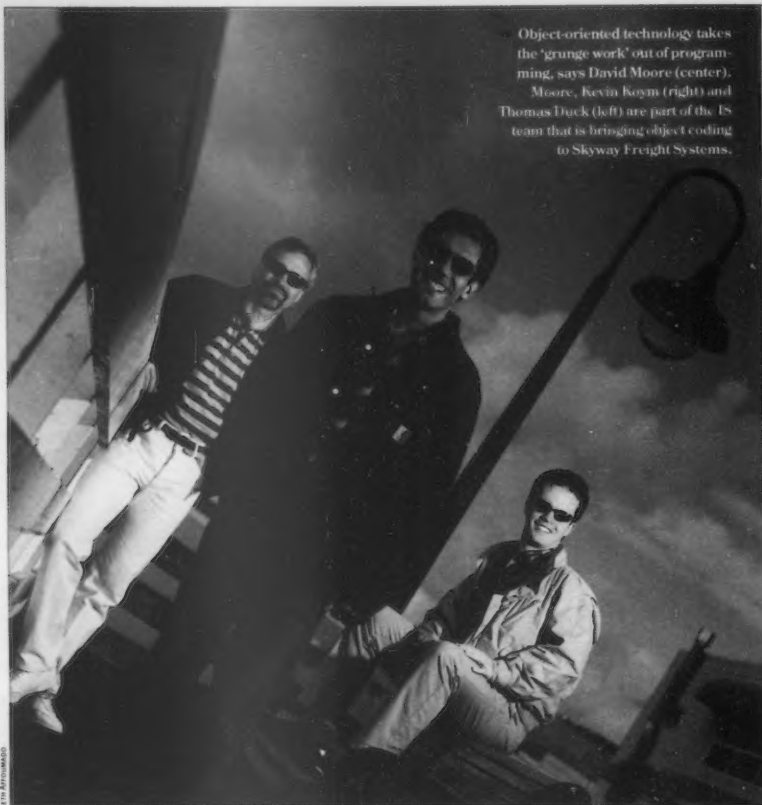
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John Dodge

Good-bye, legacy skills



Object-oriented technology takes the 'grunge work' out of programming, says David Moore (center). Moore, Kevin Koym (right) and Thomas Duck (left) are part of the IS team that is bringing object coding to Skyway Freight Systems.

Object-oriented Resource Listing

On the Web

http://www.inet.co.th/cybermall/infowave/wave_oor.html
Object-oriented resources from InfoWave (Thailand) Co.

<http://www.odi.com/oop.html>
Definitions, related links, books

<http://iamwww.unibe.ch/~scq/00info/FAQ/>
Object-oriented frequently asked questions

<http://www.sigs.com/resources.html>
Index of object-oriented resources from SIGS Publications, Inc.

Conferences

Object World East. May 5-9, Boston. Contact: (508) 820-4300.

Object Expo '96. Aug. 5-9, New York. Contact: SIGS (212) 242-7447.

Object World West. Aug. 18-22, San Jose, Calif. Contact: (508) 820-4300.

OOPSIA '96: The 11th Annual ACM Conference on Object-oriented Programming Systems, Languages and Applications. Oct. 6-10, San Jose, Calif. Contact: ACM, (212) 869-7440 or meetings@acm.org.

C++ World. Nov. 11-15, Dallas. Contact: SIGS, (212) 242-7447.

Associations

Object Management Group, Inc.
Framingham, Mass.
Phone: (508) 820-4300
Fax: (508) 820-4303

Object Database Management Group
Burnsville, Minn.
Phone: (612) 953-7250
Fax: (612) 397-7146
E-mail: dbarry@odmg.org
(Doug Barry, president)

User group

Connecticut Object-oriented Users Group
Contact: Terry McAuliffe, (203) 987-2201, cooug@aol.com.

Object-oriented challenge

CONTINUED FROM PAGE 73

and different," says Duck, who previously managed a group of legacy developers and did some Basic programming. It's an easier way for you to use structured methodologies, he says.

Object-oriented programming "takes a lot of the grunge work" out of programming, Moore says.

For example, ordinarily a programmer would have to write code to a link list or add an element at the end of a string of code. That isn't necessary with object programming because a link object already is included, Moore explains.

Object programming "lets me focus on the problem at hand and not on the lower-level stuff," he adds.

Sibling rivalries

It may have been Skyway's information systems managers who were faced with the greater challenge during the company's initial transition to object programming. Skyway employed 25 programmers at that time, and there were only 10 slots available for the NextStep project. Skyway IS manag-

ers, such as Brian Hyland, didn't want to upset the ranks when choosing an A team.

"A few people who didn't get into the training program were a little distressed," says Hyland, vice president of customer applications at the \$150 million unit of Union Pacific Corp.

But because 40% of the programming staff was suddenly removed from Skyway's full workload, the remaining staffers were too busy picking up the slack to grumble about being passed over for NextStep training, Hyland explains. "It wasn't by design that we buried them with work," he says.

Skyway sought other ways to appease its legacy programmers. For example, they were given other new technology projects to work on during and after the NextStep training. These projects included Notes development and the creation of a satellite tracking system for its customers' trucks.

Hyland tried to keep everyone satisfied about their roles in Skyway's programming department. "We probably caused a rift between the new object programmers and the other programmers," he says. Hyland says he's trying to bring them together through cross-pollination projects, where object technology is infused with Basic and Cobol.

For example, Skyway's NextStep programmers teamed up with the company's legacy systems developers to create object

interfaces with a Unidata, Inc. Pick database. The database is used by Skyway sales representatives responsible for the company's biggest customer accounts. "We didn't want to have an elite project group," Hyland says.

Tapping old skills

The NextStep candidates were chosen for their technical acumen, such as those who had C programming in their background, Hyland says. But that didn't matter much when the training began. Desire and a willingness to learn were just as important.

"I think my C experience helped in building the inside structure of the objects," says Kevin Koym, a consultant who was brought in by Skyway from VNP Software, Inc. in Boston to help mentor the programmers and build some of the programs.

Nevertheless, Koym sees a downside to C programming experience in the object world.

He notes, for example, that he's worked with veteran C developers for whom the idea of abstraction — taking a base object and moving it into a superclass — was tough to pick up.

Proof positive

So far, Skyway's results from developing object-based applications have been impressive. Before object technology, Sky-

way's five-person claims department used a two-tier claims application written in Basic. Part of the application resided on PCs in the claims department, while the server portion ran on a Hewlett-Packard Co. HP 9000 Model T500 Unix machine.

Duck and the other nouveau object programmers used NextStep to create a claims application that was more modular and had improved workflow. The claims department shrank from five people to three due to attrition, but the group increased its productivity by 400% with the new object-based application. Claims processing dropped from 10 days to five, and data entry on claims shrank from 30 minutes to five minutes.

Now that they've become highly desirable object-oriented programmers, do the Skyway programmers feel like they're more marketable?

You bet.

"I've gotten a lot more phone calls from outside recruiters," Duck says.

He's also had more time to train for 10K races. Of course, it's not like Duck pulled up the rear in his first 10K while he was juggling Skyway's NextStep program.

Of the six Skyway employees who entered the San Francisco Bay Area "Wharf-to-Wharf" race, Duck came in first. "I won all my bets," he says. It seems like a fitting finish.

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- 23. Dir./Mgr. Sys. Development, Sys. Architecture
- 31. Programming Management, Software Developers
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- 13. Treasurer, Controller, Financial Officer

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- 90. Other Titled Personnel

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- Operating Systems
 - (a) Solaris
 - (b) Netware
 - (c) OS/2
 - (d) Unix
 - (e) Mac OS
 - (f) Windows NT
 - (g) Windows
 - (h) NextStep
- App. Development Products ☐ Yes ☐ No
- Networking Products ☐ Yes ☐ No

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- App. Development Products ☐ Yes ☐ No
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Computer Careers

Trying trainers on for size

Choosing between vendors and independent training is a matter of fit

By Lynn Haber

One-stop shopping for information systems applications and hardware is a nice idea, but when it comes to training, more than one source often fits the bill.

For years, Topeka, Kan.-based Hills Pet Products turned to its reseller for both products and training. Not anymore. Today, the pet food company, which has 2,000 employees nationwide, uses multiple sources, both vendor-authorized and non-authorized, to deliver applica-

tion and hardware training to its 1,200 end users.

"We right-source," says Sherry Ulasien, team leader of information technology education at Hills Pet Products. The company seeks out vendors for off-the-shelf curricula for desktop applications, customizes the material in-house to meet the needs of IS, then hires independent trainers for delivery.

Industry participants agree there's no one right answer to the question of vendor-authorized training vs. independent training. It's very much a matter of need.

"Vendor-authorized training continues to gain ground in IS departments because certification is one way to measure quality and, overall, there's a greater market recognition of the vendor-authorized channel," says Ellen Julian, a senior analyst at International Data Corp. in Framingham, Mass.

Dennis Samuelson, director of education services at vendor-authorized MicroAge Learning Centers, which has three New Jersey locations—in Parsippany, Iselin and Saddlebrook—acknowledges that the level of quality at the authorized education centers can vary. "Some are good, some are great, but none are disasters," he says.

Independent training sources also attract a fair share of the IS training market.

"These providers tend to use a variety of channels and

media, such as self-paced, instructor-led seminars, books, tapes and multimedia, for example," Julian says.

Ulasien brings in courseware and independent trainers for just-in-time, or just enough, training. "Education is moving away from traditional classroom settings and toward a mind-set where IS users are more self-sufficient," she says. "That's where we look for a provider on the curriculum to provide

on-line tools we can customize to meet the specific business user's needs."

Either way, IS departments are wise to ask for references, inquire about the customer satisfaction policy and spend time talking about what the organization wants to accomplish after training and how the education provider will address that.

Haber is a freelance writer in Norwell, Mass.

Project makes perfect

Project management skills are becoming must-have commodities for top IS professionals

By Leslie Goff

The "ideal candidate" for a senior programmer/analyst job at Blue Cross/Blue Shield of California has four years of system design experience and demonstrated project management success.

A Fortune 500 company in Miami seeks a senior analyst with three to five years of net-

work support and project management experience.

A programmer/analyst candidate at Home Savings of America in Southern California "must possess the ability to plan, organize and execute project management and control activities."

These employment ads, copied from the Internet, confirm what a panel of experts told *Computerworld* about

why project management skills are becoming a de rigueur resume requirement.

Brian Graham, project manager, administrative information services, Columbia University, New York:

"Given that end users are increasingly sophisticated, combined with tight budgets and schedules, we can't afford an overly hierarchical structure. We organize into projects and teams. We may be involved in any number of these, in varying capacities, at the same time. And everyone is expected to contribute. We have to move quickly, be effective and work independently."

James Price, dean for research, consulting and information, Defense Systems Management College, Fort Belvoir, Va.:

"When you're producing an IS project, it has to be of high quality, meet customer requirements and come in on budget and on time. It is a very complex undertaking;



DENNIS SAMUELSON, director of education services, MicroAge Learning Centers

"REGARDLESS OF WHETHER IS IS SEEKING OUT VENDOR-AUTHORIZED TRAINING OR INDEPENDENT TRAINING SOURCES, WORD-OF-MOUTH RECOMMENDATIONS FROM THEIR PEERS CAN BE INVALUABLE."

WEIGHING THE ADVANTAGES

Both sources of training offer attractions

VENDOR-SPONSORED TRAINING

- Market recognition
- Certification clout
- Product/application knowledge

INDEPENDENT TRAINING:

- Reduced cost and time
- Flexibility
- Customized systems

just about the only way we can process it all in our brains is to break it down into a series of tasks and objectives."

Julie Wilson, consultant, Newport Beach, Calif., and co-chairwoman, Information Systems Special Interest Group, the Project Management Institute, Upper Darby, Pa.:

"Technicians need to be aware of, and practice, risk assessment, contracting and procurement, managing people and being an excellent communicator. The difference between a good project manager and an excellent one is the way in which they manage the people on their teams, listen to and manage customer expectation levels and their ability to integrate all the pieces [of the project] into a cohesive and successful end."

Alexis DePlanque, analyst, advanced information management strategies service, Meta Group, Inc., Stamford, Conn.:

"Project management skills, [and] other business-oriented skills, are becoming key differentiators for advancement within IS groups. IS organizations are increasingly outsourcing the project management function. As this happens, it will become imperative, even for low-level IS staff, to have project management skills to support internal development in tandem with the external project management group."

Goff is a freelance writer in New York.



1-A Thinking Machines computer.

PROJECT MANAGEMENT RESOURCES

For more information on project management as a formal discipline, the Project Management Forum includes the following hits on its World Wide Web, site (<http://www.synapse.net:80/~today/PMForum/>)

- **THE PROJECT MANAGEMENT INSTITUTE**, Upper Darby, Pa. The institute supports special interest groups (SIG) in a number of industries, including the Information Systems SIG and an Information Management and Movement SIG dealing with data communications. Call (610) 734-3330, or visit PMI's home page via the Project Management Forum on the Web.
- **THE FORUM**, maintained by a Canadian project management services firm, brings together a number of publications, job postings, professional organizations, training firms, vendors and practitioners concerned with project management.

Geography Information System Analyst: develop geographic information system (GIS) related industry GIS applications using ArcInfo, ArcView 2, Atlas GIS Mapping & other s/w; program in Avenue, AMI, Visual Basic & C++ on both UNIX & PC platforms; perform application & database design & data communication on Local Area Network, Ring MS in geography; 1-yr exp involving use of ARC/INFO, dBase; complete graduate courses each in GIS, Data Structure, UNIX Environment, Urban Regional Planning & Computer Mapping, 40hr/wk, 8-5pm, \$38,570/yr. Employer paid ad. Send resumes to 7310 Woodward Ave. Rm 415, Detroit, MI 48202. Ref No. 046-96.

Software Engineer, Detroit, MI: Analyze, design, develop and implement financial and commercial system using application software associated with relational database, ORACLE in multiprocessor environment using SUN/SPARC, IBM RS/6000, under Sun OS, SQL, Visual Basic, C, and C++ in TCP/IP network environment. Maintain PL/SQL, SQL forms, Report tools, and application and write user exits. Perform writing shell scripts, program in C and MIDL applications using Micro Station platform. Req'd: B.S. in Engineering or Computer Science, 1 year exp in job offered, 40 hr/wk, \$43,000/yr. Employer Paid ad. Send resumes to 7310 Woodward Avenue, Room 415, Detroit, Michigan 48202. Reference No. 13794.

Product Development Engineer: design, trouble shoot & develop h/w & s/w specifications for interior electronics modules of Jeep Grand Cherokee; these interactive electronics modules are responsible for functions such as power lock, power window, power mirror, memory config system, heated seat & remote keyless entry; EMC tests & compatibility of these modules to EMI are another responsibility of this position. Req. MSEE in computer eng; 1 yr automotive exp in OEM involving design & diagnosis of microprocessor based electronics module for eng & transmission control. 40hr/wk, 8-5pm, \$788/wk. Employer paid ad. Send resumes to 7310 Woodward Ave. Rm 415, Detroit, MI 48202. Ref No. 05096.

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SOFTWARE ENGINEER required. Design & develop under Windows 3.1 & Windows NT platforms using object oriented design & analysis tools. Visual Basic, MFC (Microsoft Foundation Class) library, (Application Programmer's Interface) & OLE (Object Linking & Embedding) technology. Implement Inter Process Communication (IPC) within Windows NT programs using Windows Sockets & TCP/IP based protocols. Database development using distributed object technology, ObjectStore, ESOLC & experience with the C++ based GUI tool kit, Interviews. Master's Degree or its equivalent in Computer Science, Computers or Engineering, plus 1 year experience in the job duties described above. University work experiences (other than mere classroom study) may be used to satisfy the experience requirements. Must have proof of legal authority to work in the U.S. Salary: \$43,500/year for a 40 hour work week. Apply at the Texas Employment Commission, Fort Worth, Texas, or send resume to Texas Employment Commission, TEC Building, Austin, Texas 78778-0001. J.O. Number TX75725C. Ad paid by an Equal Opportunity Employer.

CONSULTANT - to analyze client company's data processing requirements & comp. h/w to determine s/w which will best serve those needs, then design comp. sys. integrating h/w & s/w which will process client's data in most timely & inexpensive manner & implement design by overseeing installation of the necessary sys. s/w & customization to client's unique requirements; install & support CAD/CAM applications; use UNIC, maintain file systems, print services, file transfer services. Req. Bach. in Comp. Sci., Systems Analysis or Management Information Systems. Part of a university course which included the use of each of the following: SUN, DEC UNIX Workstations, C/Bourne Shell, X-Window and C. \$31,500/yr, 40 hrs/wk, 8a-5p. Send resume to 7310 Woodward Ave. Rm 415, Detroit, MI 48202 & include Ref #152495. Employer Paid Ad.

Software Engineer, 40hr/wk, 8:30am-5:30pm, \$40,100/year. Provide in-depth financial analysis for clients, specialized for credit card database systems. Apply database, statistic engineering theory, using Oracle® DBA, Proc., OCI, C++, SAS, Visual Basic to design and develop marketing database of credit card system for clients under UNIX environment. Qualified applicant must have BS and MS of Computer Science, also one year full-time industrial working experience for financial database (related occupation - programmer). Applicant must have proof of legal authority to work permanently in the U.S. Send two copies of resume & cover letter to: Illinois Department of Employment Security, 401 South State Street - 3 South, Chicago, IL 60605. Attention: Janet Aschenbrenner, Reference #V-L 11928-A. An Employer Paid Ad. No Calls.

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IEF PROGRAMMER ANALYST required. Develop Information Systems through detailed Requirements Analysis, Business Area Analysis & complete Business System Design & Technical Design, including written documentation using structured interviewing techniques & overall knowledge of financial applications. Two years experience required in Information Engineering consulting. Experience must include one year of Information Engineering consulting in the Health & Human Services area using IEF Case tools (Version 5.2 or later) with DBM on OS/2 platforms & DB2 on MVS platforms. Client/Server technology & Query languages OMF & SPUFI. Applicant must also have prior project experience with Screen Design & coded on-line Procedure Action Diagrams & Action Blocks. Must have proof of legal authority to work in the United States. Salary: \$62,000/year for a 40 hour work week. Send your resume to Bernard Childerson, Nebraska Department of Labor, P.O. Box 9400, Lincoln NE 68509. Refer to Job Order Number NE0154746. This advertisement is paid for by the employer.

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PROGRAMMER ANALYST (2 openings) (Ref. 196895) to plan, develop, test & document comp. programs, applying knowledge of programming techniques & comp. systems; evaluate user requests for new or modified programs to determine feasibility, cost & time required; consult with users to identify current operating procedures & clarify program objectives; formulate corporate technical training strategies for effectively transferring the skills of the organization's technical staff from traditional computing to the client-server computing paradigm, involving the use of relational databases, graphical user interfaces, object-oriented technologies & CASE tools for developing commercial business applications; use of relational database management systems such as Oracle, Sybase & Informix as a database server running interface software such as Visual Basic, PowerBuilder, Motif & C++ design & develop client-server systems using modern computer aided software engineering tools to help in sys. analysis & design. Tools used include DB2, CICS, SQL, VS COBOL II, UNIX, ADW & MicroFOCUS WORKBENCH in IBM ES/9000 environment. Regs. Bach in Comp. Sci., Systems Analysis, Computer Information Systems, Computer Engineering, Electrical Engineering, Electronic Engineering, Mathematics or its equiv. in ed. & exp. 2 yrs. exp. in job offered or 2 yrs. related exp. as a Programmer, Programmer Analyst, Senior Programmer Analyst, System Analyst or Consultant. Will accept 3 yrs. of college ed. plus 3 yrs. exp. in the job offered or in a related occupation in lieu of the req'd ed. & exp. Must have some related exp. including design, testing, system integration and implementation & using each of the following: IBM ES/9000, DB2, CICS, VS COBOL II, UNIX, ORACLE, ADW & MicroFOCUS WORKBENCH. \$46,500/yr., 40 hrs/week, 9a-5p. Send resume to 7310 Woodward Ave., Rm 415, Detroit, MI 48202 & include Ref # Employer Paid Ad.

Software Development Engineer Will create, develop, implement, & modify a multimedia (picture and data) computer-based image processing systems which allows storage in a PC-based computer of video images of various jewelry for purposes of establishing a catalog of inventory items for use by members of jewelry industry. Will ensure that systems allow saving of images in full motion in a MPEG file format, including motion device sensor which will be controlled by capturing software systems, in addition to saving still pictures in a JPEG file format. Will establish system to insure video output and input are on a RGB base and that picture quality will meet 24 bit picture standards. Will create and develop a catalog on CD-ROM, including graphic programming for high resolution pictures, to insure receipt of such 24 bit picture and establishment of a database to allow individual jewelers to create a customized database concerning price, quality and other market factors. Will implement such systems for use in Client/Server platforms using a MS/SQL Server and Windows NT. Requires Bachelor's degree in Computer Science. Also requires two years experience in the job to be performed. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at \$50,000 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send two copies of resume to: Illinois Department of Employment Security, 401 S. State St., 3 South, Chicago, IL 60605, ATTN: Joan Sytkan, Ref #V-1, 13863-S, No Calls, An Employer Paid Ad.

SOFTWARE ENGINEER - Design, develop and implement software to support network (PC LAN, OS/2, Novell) and mainframe (HP3000, TWOS, IBM, CIMS) based computer systems. Application development in CLIPPER, C++ and Windows environment. Develop database utilities to generate customized reports. Masters Degree in Mathematics, Computer Science or Manufacturing Engineering and 1 year of experience as Software Engineer including one year of experience in software development in manufacturing environment as Software Engineer with MS-DOS, Windows, RISC 6000, Novell, VAX/VMS, Fox Pro, Quattro Pro, C, Fortran, CLIPS, and Harvard Graphics. This experience is included in one year experience. M-F, 7:30a-4:30p, 40 hrs/week, \$40,945/yr. Employer paid. Send resumes to 7310 Woodward Ave., Room 415, Detroit, MI 48202. Ref #177495.

Multiple openings exist for a Systems Analyst for a software consulting firm. Duties include: Design, development and analysis of windows-based database applications in Visual Basic and PowerBuilder using Object-Oriented programming and methodology. Design and develop software systems using graphical user interfaces with client server architecture. Design and optimize relational databases including data modeling and specifications, and write stored procedures for data base management systems. To include the following Tools: Visual Basic 3.0, SQL Server, DB2, AGODOBC, Named Shared Memory, ODBC, Crystal Reports 4.0, PowerBuilder 3.0a), C++, Windows SDK, Oracle 7.0), SQA team test, System Architect and PVS. Requires a Bachelor's Degree in Computer Electronic Engineering. Requires two years experience in the job offered or two years experience as a Software Analyst to include the following experience: -PowerBuilder 3.0a), C++, ORACLE 7.0). Salary is \$44,745.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref. #01896 Employer paid ad.

Software Engineer Creates and develops a Visual based Graphic User Interface system which coordinates event controls and application management for use in an investment management relational database system (Oracle and Sybase). Performs real-time network communication programming and software system interface communication controls between application management interface which modifies schedules and installs software application programming in conjunction with event controller control system. Will use Visual C++ 2.0 in a client/server environment including TCP/IP communication programming to develop applications under a Windows NT and Windows 95 environment. Requires Master's degree in Computer Science. Also requires three years experience in the job to be performed or three years experience as a Software Engineer. If experience in related field, entire experience must be in the development of a real time distributed operating control system in a Windows NT environment using C++ and SQL. Hours: 9:00 a.m. - 5:00 p.m. 40 hours per week at \$50,350 per year salary. Must have proof of legal authority to work permanently in the U.S. Please send resume to: Kathi Fozz, HR Administrator, Melson Technologies, Inc., 707 Skokie Boulevard, Northbrook, Illinois 60062. No Calls.

Multiple openings exist for a Software Analyst for a software consulting firm. Duties include: Consult with clients to define their business requirements and utilize technical expertise to provide solutions to their problems. Also, design, develop and analyze clients' data processing and production systems under Client/Server architecture such as Microsoft Windows, Visual Basic, C++, Microsoft SQL Server, DB2, Microsoft Access, ODBC/DB-Library MDI Gateways and using third party custom controls. Hardware used: Pentium Server, and Pentium, Client. Requires a Bachelor's Degree in Computer Science. Requires two years experience in the job offered or two years experience as a Software Consultant to include the following experience: -Design and development under Microsoft Windows, Visual Basic, C++/Visual C++ and Microsoft SQL Server. Salary is \$44,745.00 per year. Hours are 8:00 am to 5:00 pm, forty per week. Send resume to 7310 Woodward, Room 415, Detroit, MI 48202. Ref. #01996 Employer paid ad.

SYSTEMS/SOFTWARE INSTRUCTOR required teach lecture on systems & software engineering methods & languages including: 1) Algorithm, modeling & mathematical optimization; 2) C++; 3) Object Oriented programming; 4) Object Oriented Design & Analysis; 5) Microsoft Foundation Classes (MFC) & Visual C++; 6) Develop training material & practical exercises to support lectures. Master's Degree or its equivalent required in Math, Computers or Engineering, plus 2 years experience in the job duties described above. Must have proof of legal authority to work in the U.S. Salary: \$41,000/year for a 40 hour work week. Send resume to the Texas Employment Commission, TEC Building, Austin, Texas 78778-0001 J.D. Number TX7503224 Ad paid by an Equal Opportunity Employer.

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requirements, procedures, and

problems in order to automate

the processing or to improve

existing computer systems.

Writes detailed description of

user needs, program functions,

steps required to develop or to

modify the computer program.

Reviews the computer system

capabilities, work flow and

scheduling limitations in order to

determine if the requested program

or program changes are

possible within the existing system.

Studies the existing information

processing systems in order to

evaluate the effectiveness and

develops new systems to

improve production or work

flow, as required. Prepares work

flow charts and diagrams to

specify in detail the operations to

be performed by the equipment

and the computer programs, and

the operations to be performed

by the personnel in the system.

Conducts studies pertaining to

the development of new information

systems for the aviation

industry in order to meet the current

and projected needs. Plans and

prepares technical reports, memoranda,

and manuals as documentation of

program development. Upgrades

the system and corrects the errors

in order to maintain the system

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We are seeking an experienced Programmer/Analyst with strong project management skills required to lead an Information Systems project. Primary responsibilities focus on providing leadership to the project team in the implementation, maintenance, support and/or conversion of information systems, and creating written design specifications for new applications and systems development projects. The ideal candidate will be a self-starter with a clinical and systems administration background, hands-on experience managing high level user groups and implementing automated systems. Experience and training in a specific clinical discipline or project management essential; high-level PC skills including Excel and Microsoft Project highly desirable. Medical Records/Imaging experience a plus. A Bachelor's degree required; Master's or advanced degree in business or computer technology an asset.

Clinical Systems Analysts

(Programmer/Analyst II)

We currently have outstanding opportunities for two experienced Programmer/Analysts with the skills and experience to develop our Medical Center's integrated Clinical Information System. Demonstrating an ability to work well on team projects, you will analyze current and future needs and interact with clinical departments to tailor and test various systems. Responsibilities will include coding and programming screens to be used by clinicians. Must have a knowledge of TDS Systems, Matrix and RFT coding plus a strong knowledge of at least one clinical or application area and system implementation process. A Bachelor's degree required; Master's preferred, or experience in health care. Strong PC skills, including WordPerfect, Excel and TSO, highly desirable.

Administrative Systems Analyst

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An excellent opportunity exists for a professional with demonstrated experience in implementing hospital administrative systems. Responsibilities include project implementation, application testing, system documentation, and end-user training, maintenance and support. This position requires a working knowledge of either HBOC PM, Medpac or equivalent applications, and experience supporting end-users and project teams. A Bachelor's degree, plus excellent problem-solving, group and interpersonal skills, required. Strong PC skills, including WordPerfect, Excel and TSO, highly desirable.

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Product Support Specialist. Charlotte computer consulting firm seeks individual to perform programmer/analyst duties in the context of a textile and environmental protection system. Use Foxpro 2.5 for DOS, Foxpro 2.6 for Windows, Symbol programming, Comm Tools for DOS and Windows on file transfer to transfer the existing TEX-PAK and EPIC Software packages to accommodate client needs. Responsible for the design, coding, implementation, maintenance and customer support of various PC application products including TEX-PAK and EPIC System with relational database. Qualified applicants must possess a Bachelor's Degree in Computer Science or a related field and 6 months experience as a product support specialist or 6 months experience programming in relational databases. Applicants must have knowledge of Relational Databases (SQL, Oracle Database III), Networking (Novell, Lantastic), Languages (C, SQL, C++, ADA, Basic, Cobol) and knowledge of DOS, Windows, UNIX, VMS, M-F 9:00 - 5:00 Annual Salary of \$34,757.65. All resumes must include the applicant's social security number. Send resume to Job Service 500 W. Trade Street, Charlotte, NC 28202. Refer to Job Order NC2653383. DOT 030.162-014.

Production Systems/Support Systems Analyst: Provide software application dev. for user support, requirement definition, system analysis/design coding, testing, & prepare structure charts, data flow diagrams, min-spec/program flow charts using case tools, re-engineering, enhancement to improve performance/simplify existing software applications & SQL for Customer Information System, Project & Financial Accounting Management Systems on IBM Mainframe using MVS/JCL, DB2, VSAM, CICS, VS COBOL II & Change Management Tool. Provide maintenance/call out support to computer ops to carry outabend analysis using CICS Dump/System Dump. Correct failures/problems, debug/fix abends in on-line production applications, night running production batch applications, programs. Use MVS/JCL Jobs/PROCS to set up MVS/JCL PROCS/JOBS/restarts after abends/failures. Req: Bachelor's in Mechanical Engineering, Computer Science or closely related discipline + 2 yrs exp in position or 2 yrs as a Project Manager. Need knowledge of MVS/JCL, JCL, CICS, & analysis. \$50,000/yr, 40 hrs/wk, 8-5. Submit resume to: Job Service of Florida, 701 SW 27th Avenue, Room 47, Miami, FL 33135-3014. Re: Job Order # - FL1366870.

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VLSI Circuit Designer: Circuit design and layout of complex components in CMOS technology used in development of RISC microprocessor integrated circuits; circuit design and characterization of I/O buffers in multiple packages including development of circuit simulation environment for various pins and packages; development of test cases for characterization of the chip with various loads, environment and packages; development of functional models from an architectural specification of RISC microprocessor integrated circuits including memory management unit and peripheral, schematic capture, logic design, layout, verification of design including logic simulation, MS-Elect. Eng. University level training, research background or experience in the following: design, simulation and characterization of analog circuits; design and simulation of digital CMOS VLSI circuits; design of combinational and sequential circuits; CAD tools for VLSI design; operating system principles and techniques; UNIX/C programming. Salary: \$46,000/yr. Job Site & Inv.: Austin, TX. Apply at the Texas Employment Commission, Austin, Texas or send resume to the Texas Employment Commission, TEC Bldg., Austin, Texas 78778, J.O. #TX7518769. Ad paid by an Equal Opportunity Employer.

Programmer/Analyst (Houston, TX area client site) Design, develop, code, test, implement, and maintain commercial and financial applications using CICS, DB2, and IMS on IBM mainframes. Bachelor's degree in Comp. Sci., Math, Engineering or Business Admin. and 2 yr. exp. in job req. 40 hrs/wk. 9-5, \$36,860/yr. Apply at the Texas Employment Commission, Houston, TX, or send resume to the Texas Employment Commission, TEC Building, Austin, TX 78778, J.O. #TX7505239. Ad Paid by an Equal Opportunity Employer.

Computer analyst/programmer. Provide support, maintenance, analysis and programming for Powerhouse (including GDD, PDI, Quick, Quiz, QTP, Qutil and Archlet) Quark and Image, KSAM and CSAM file systems. Must demonstrate ability to operate HP3000 MPE and HP Unix, radio date terminals and produce software related to EDI. Requires six years of experience and one year of training. Salary \$55,000 per year. 40 hours per week, 9:30 a.m. to 5:00 p.m. Interested applicants please apply in person or by resume to Allen Labor Analyst, JETS, 201 East Washington Avenue, Room 211X, Madison, Wisconsin 53707.

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Regional Scope

Shining in the Show Me State

Low unemployment and a diversified economy make Missouri a gold mine for IS professionals

BY ROBERT KRONEMYER

The Gateway Arch in St. Louis beckons millions of visitors a year, but it is also a mecca for jobs in information systems.

Due to low unemployment and a diversified economy, statewide demand for IS professionals this year promises to be even stronger than it was last year—which was a good year by most accounts.

The hiring rate is sky-high at McDonnell Douglas Corp. in Kansas City. "I could use 150 Ada programmers right now," says Jim Diller, an administrator in professional employment at the company. McDonnell Douglas workers develop software for fighter aircraft and missiles.

Regardless of industry, Missouri is fertile ground for a wide range of IS skills.

"There is demand across the board—everything from old IBM mainframe technology to SAP," says Rick Sievers, a staffing specialist at RHI Consulting in St. Louis, a division of Robert Half International, Inc.

The health care, financial services and manufacturing industries show particular hiring promise because of shifting technologies, Sievers says. But client/server or systems architecture experience will greatly expedite an applicant's job search in any industry.

"The No. 1 thing I'm looking for is SQL expertise. We're mostly involved with server/client development," says Chuck Miller, MIS director at Spectrum Healthcare Services in St. Louis.

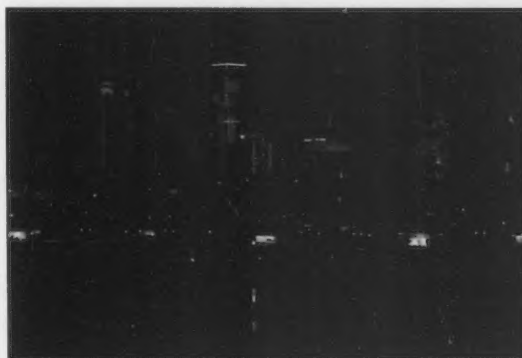
The outsourcing firm for health care workers, including physicians and nurses for hospitals, prisons and military facilities, expects to increase hiring this year. In addition to SQL skills, the company seeks candidates with Unix exper-

tise and a C/C++ programming background.

Bill Gura, a senior technical recruiter at Sprint Corp. in Kansas City, says his company also seeks candidates with knowledge of Unix and C.

Client/server demand

Statewide, there is strong demand for client/server development tools. Familiarity with graphical user interface products such as Microsoft Corp.'s Visual Basic and Powersoft Corp.'s PowerBuilder can be the ticket to a job, according to Kim Egelhoff. She is marketing director at William Byrne & Associates, Inc., a consulting and software



Kansas City has plenty of jobs in both the client/server and mainframe markets

development firm in St. Louis. Applicants with experience in relational database products, specifically Oracle Corp.'s Rdb, also are valued.

"Technical skills are very important. However, ideally we look for candidates with well-rounded communication skills and a strong work ethic," Egelhoff says.

The continued popularity of mutual funds is propelling DST Systems, Inc. in Kansas City, which processes information for the financial sector nationwide. "On the mainframe side, we're looking for Cobol and Cobol II, CICS and [IBM's] DB2, TSO and ISPF," says Lisa Cowart, a technical recruiter. In the client/server arena, the company seeks those with C/C++ and any relational database skills.

Contract work

Job applicants shouldn't overlook contract work in their quest for permanent positions.

"The one thing I've noticed about the St. Louis market is that it's difficult to fill contractor openings because of the high demand," says Denise Callahan, applications development manager at National General Insurance Co. in St. Louis. The firm uses contract programmers. Callahan says many contractors citywide are permanently placed in a client/server environment.

National General, a property and casualty insurance company, is one of the few businesses that expects to maintain its permanent staffing level through this year. It will, however, add contract employees to its rolls.

"We're pretty much still mainframe-based, so we'd be looking for more typical Cobol fourth-generation language relational database," Callahan says. She says the company uses Natural language by Software AG in Germany. The company doesn't do much developing in the client/server arena, but it has an opening for someone with Unix experience to work on a project.

Overall, "It's a very open market for IS people right now," says Shanna Tibbetts, a technical recruiter at DST Systems. "In fact, I think there's almost a shortage of IS people here in Kansas City, and I see that continuing."

Kronemyer is a freelance writer in Elkhart, Ind.

JANUARY 22, 1996 COMPUTERWORLD

ST. LOUIS

Top employers (by number of employees)

McDonnell Douglas Corp. - 24,500
BIC Health System - 21,677
Scott Air Force Base - 10,174
Schnuck Markets, Inc. - 9,646
Washington University - 9,235

At-a-glance

Population (greater area)
2.5 million

Unemployment
3.6% (October 1995)

National unemployment average
5.5% (October 1995)

Median housing cost
\$93,900 (September 1995)

KANSAS CITY

Top employers (by number of employees)

Federal government - 28,000
including Federal Reserve Bank
Sprint Corp. - 9,041
State of Missouri - 8,799
Health Midwest - 8,360
Kansas City Public Schools - 7,200

At-a-glance

Population (greater area)
1.65 million

Unemployment
3.2% (October 1995)

National unemployment average
5.5% (October 1995)

Median housing cost
\$93,500 (Third-quarter 1995)

Sources: Greater Kansas City Chamber of Commerce, Missouri Division of Employment Security, National Association of Realtors, St. Louis Regional Commerce Growth Association, St. Louis Association of Realtors.

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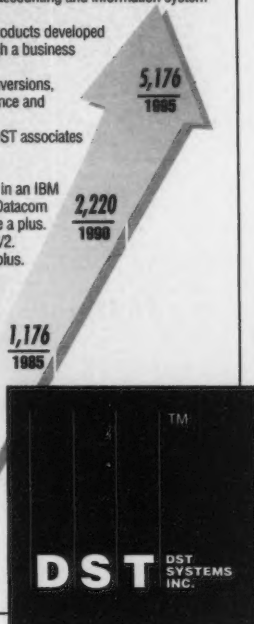
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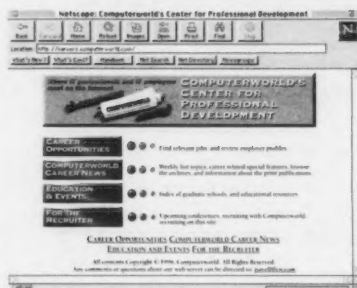
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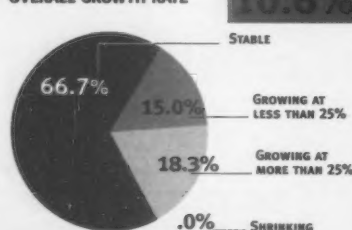
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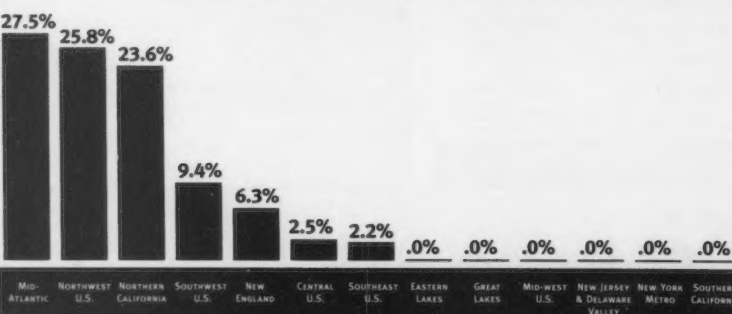


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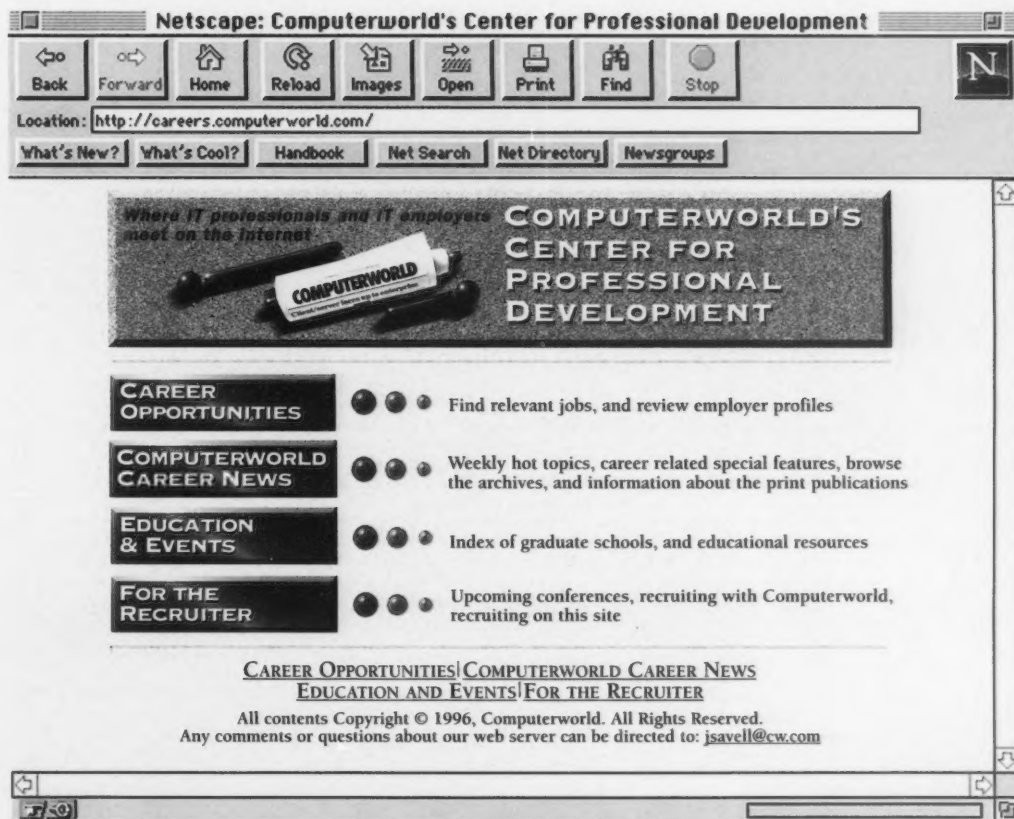
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Marketplace

By Paul Korzeniowski

Application suites quickly became popular after their arrival a few years ago.

The suites bundle packages such as graphics, spreadsheet and word processing applications and provide links among the applications.

"Companies understood the cost savings suites offered compared [with] buying stand-alone applications," notes Bryan Fukuda, an industry analyst at Dataquest, Inc., a market research firm in San Jose, Calif.

Their low price has made the suites so popular. The suites cost between \$199 and \$599, compared with \$99 to \$350 for each of the stand-alone applications.

Consequently, suite sales have been eating away at stand-alone applications revenue.

Dataquest found that sales of PC word processing systems fell from \$1.3 billion in 1994 to \$1 billion last year. Spreadsheet revenue dropped from \$800 million to \$400 million in the same period. In comparison, suite revenue rose from \$2.24 billion in 1994 to \$2.8 billion last year.

Bargain shoppers

Savvy shoppers are behind the changing numbers. New York State Electric & Gas Corp. in Binghamton, N.Y., has 4,500 employees in 15 offices throughout the state. The employees work primarily with PCs that run Windows.

John Gasstrom, manager of personal productivity at the energy company, says that in 1993, users became interested in Lotus Development Corp.'s Freelance graphics package and Organizer

scheduling system. Many users already were working with Lotus' 1-2-3 spreadsheet, so spending \$399 for Lotus' SmartSuite — which includes Freelance, Organizer, Approach database management system, 1-2-3 and WordPro word processor — was cheaper than buying stand-alone applications.

To further entice users, Lotus offered big discounts to users who upgraded to the suite from its stand-alone applications.

"We ended up paying half of the list price," Gasstrom says. He bought the software from resellers Egghead Software and Stream, Inc.

Lotus, Microsoft Corp. and Novell, Inc. are players in the suite market, but Microsoft clearly is the dominant supplier. Microsoft Office accounted for almost nine out of 10 suite sales last year, according to Dataquest.

Microsoft's advantage is that its bundling deals are with leading PC suppliers, such as Dell Computer Corp. and Gateway 2000, Inc.

Systems Engineering Solutions, Inc., a Huntsville, Ala., inte-

grator that works with U.S. Department of Defense agencies, opted for the bundled approach. The company oversees PC purchases for the U.S. Army Missile Command.

1,500 Microsoft Office users.

Bundling represents only a small portion of sales for SmartSuite, according to David Laverty, director of applications marketing at Lotus.

User companies seldom pay list price for suite software, Fukuda says.

Suppliers refuse to disclose their discounting options, but they vary greatly and can lower suite prices to as little as one-third of the list price.

Other benefits

Price is a major consideration, but suites offer companies other benefits, including reduced training costs.

Gasstrom found that workers can move easily from one application to another because there is a consistent set of user commands.

Reduced installation and support costs are other benefits. "A company has to maintain [only] one application rather than a handful of them," notes Dennis Tevlin, group manager for Microsoft's Office.

But maintaining those application suites can be a concern when

your vendor — Novell for example — says it wants to move out of the suite business, users and analysts say.

Novell's PerfectOffice customers are waiting for that company's next move.

Sheppard, Mullin, Richter & Hampton operates four law offices in California and has 500 employees.

The firm had been using WordPerfect, a favorite with law offices, when Novell entered the suite game. As a special promotion, Novell offered users an upgrade from WordPerfect to PerfectOffice for only a few hundred dollars.

Eric Goldreich, director of information systems at the law firm, said PerfectOffice also worked with the firm's document management system and offered tighter integration than Microsoft Office.

The upgrade was a cumbersome process. "We invested a lot of time and money in training in moving to PerfectOffice, so we have no desire to buy another suite now," Goldreich states.

If the law firm or any of the 10 million PerfectOffice users decide to trade in the Novell suite, competitors would be happy to help with the transition. Vendors offer special deals to companies that trade one suite for another; list prices can be as low as \$199.

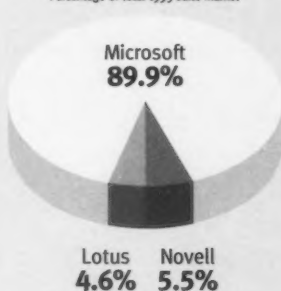
Consequently, observers expect pricing pressure to continue in the applications arena.

"During the past few years, suite prices have fallen by approximately 10% per year, and I expect that trend to continue," Tevlin says.

Korzeniowski is a freelance writer in Malden, Mass.

Bundling fuels Microsoft growth

Percentage of total 1995 suite market



Source: Dataquest, Inc., San Jose, Calif.

Richard Williams, a systems engineer at Systems Engineering Solutions, says acquiring PCs bundled with Office was cheaper and simpler than buying applications in a piecemeal fashion.

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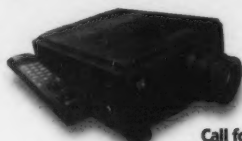
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Project: The Massachusetts Aeronautics Commission (MAC) is soliciting proposals (RFP) from interested vendors to provide a total solution for upgrading the MAC's information system. The project will include: upgrading the existing hardware and software infrastructure; development & implementation of a relational database management system; and development of a document management system.

Additional Information: Copies of the RFP will be available on Monday, January 22, 1996 and can be obtained by contacting Melissa Burnard of the MAC at (617) 973-8881. There will be a Vendor's Conference held in MAC's Conference Room at address below at 2:00 p.m. on Monday, February 5, 1996. Proposals are due no later than 2:00 p.m. on Wednesday, February 21, 1996.

Massachusetts Aeronautics Commission
10 Park Plaza, Room 6620
Boston, MA 02116-3966

**The City of New York Request for
Information Marketing City Databases**

The City of New York's Department of Information Technology and Telecommunications (DoITT), in collaboration with the Mayor's Office of Operations, the Office of Management and Budget and participating City agencies is seeking information on ways the City can offer, market and sell its most frequently publicly accessed and requested data, specifically enhanced data. Enhanced data is information accessed on-line or via other electronic means for purposes other than agency operations or agency record keeping. We are seeking input on the marketability of such data including who may want such information, the market rate of such information, what format it would take, any services currently in place which provides this type of information to the public, etc. For a complete description of our need, please call Sueleen Schulman, DoITT's Agency Chief Contracting Officer at (718) 403-8464. Leave your company's name, address, telephone number and contact person and we will gladly mail you a copy of the detailed RFI. Or you may pick up the RFI at DoITT, 111 Metrotech center, Brooklyn, New York, 3rd floor, between the hours of 9 a.m. and 5 p.m. The closing date for your written responses is February 14, 1996 close of business.

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Last Week's Computer Stocks

Gainers Losers

Percent

SIERRA SEMICONDUCTOR	24.5	MERSEL	-27.9
NETFRAME	23.1	SPRILAND INC.	-21.3
BORLAND INT'L INC.	22.9	EMULEX CORP.(B)	-20.8
SYBASE INC.	22.1	INTUIT INC.	-18.9
OCYTEL COMMUNICATIONS CORP.	20.7	WITTENITZ	-18.2
IBM	20.1	BOLT, BERANKE AND NEWMAN	-17.6
TRIVISION CORP.	18.5	QUARTERDECK CORP.	-16.9
US ROBOTICS	18.0	DATAWARE TECHNOLOGIES INC.(L)	-16.1
IBM	17.38	INTUIT INC.	-12.38
US ROBOTICS	13.56	SPRILAND INC.	-6.13
ARCON CORP.	8.38	BOLT, BERANKE AND NEWMAN	-5.25
DIGITAL EQUIPMENT CORP.	7.88	IONERA CORP.	-5.00
MICROSOFT CORP.	7.30	INTEL CORP.	-4.13
COMPUTER SCIENCES	7.13	APPLE COMPUTER INC.	-4.13
COMPUTER ASSOCIATES	7.00	LATITUDE SEMICONDUCTOR	-4.13
CASCADE COMMUNICATIONS	6.81	QUARTERDECK CORP.	-3.38

Dollar

A walk on the wild side

Children's literature rarely pops up on Wall Street, but two technology stocks, Intel Corp. (INTC) and Diamond Multimedia Systems, Inc. (DMD), last week spent a few days in a place that children's author Maurice Sendak once described as "where the wild things are."

The Nasdaq Stock Exchange exploded after Intel announced lower than expected earnings for the quarter ended Dec. 31. By the end of trading, Nasdaq had posted its second busiest day ever. More than 68 million shares of Intel had been traded (a new trading record for the exchange), and Intel stock had dropped \$5 per share, more than 10% of its value (see chart).

"Intel underestimated the complexity of the motherboard business," said C. B. Lee, an analyst at Hancock Institutional Equity Research in San Francisco. The motherboard industry is "closer to the buying public and the fickle customer," Lee said. This is a segment of the industry where companies "have to manage inventories, as opposed to the fairly insulated world of microprocessors," he said. Other companies close to the PC-buying public also have had a difficult quarter, Lee said.

Growing pains

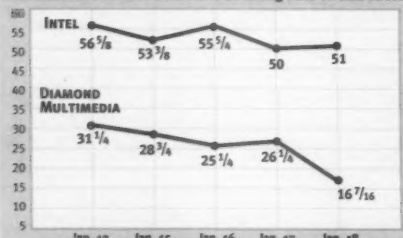
Diamond Multimedia Systems, a manufacturer of multimedia and graphics accelerator subsystems, saw its stock plunge \$10 — more than 40% of its value — in one day.

Youssef Squali, an analyst at Laidlaw & Co. in New York, said Diamond's difficulty stems from a \$2 million write-off the company took to cover an inventory discrepancy. "It looks like a one-time situation, but the company hasn't been able to account for the difference, which has led to a slight loss of confidence and credibility in the market," he explained.

Other than these growing pains, Squali said, Diamond is a "terrific company that grew 130% [last year], with sales that were higher than analysts had predicted." — *Stewart Deck*

Fasten your seat belts

Intel and Diamond Multimedia took hair-raising rides on Wall Street



Each	52-Week Range	Jan 19 Net Wt Pct	Change	Each	52-Week Range	Jan 19 Net Wt Pct	Change
Computer and Peripherals				Computer and Peripherals			
COMS	53.63	22.25	3COM Corp.	43.50	1.88	4.3	
AIT	50.88	40.75	AMERITECH CORP.	58.50	1.75	3.1	
APTS	15.00	5.38	APERTUS TECH. (L)	5.38	-1.00	-15.7	
T	68.88	47.88	ATT	66.00	0.38	0.6	
ASND	42.00	6.00	ASCEND COMMUNICATIONS	42.00	4.00	10.5	
BNYN	19.38	6.00	BANYAN SYSTEMS INC.	8.50	-1.50	-15.0	
BNST	50.00	18.88	BAY NETWORKS INC.	46.63	1.25	3.2	
BEL	71.13	49.63	BELL ATLANTIC CORP. (H)	69.38	0.63	0.9	
BLK	45.88	27.25	BELLSOUTH CORP.	42.50	0.25	0.6	
IBM	48.75	14.88	BOLT, BERANKE AND NEWMAN	28.75	-6.13	-17.6	
BRT	32.00	10.00	BROOKTRUST TECHNOLOGY	31.13	1.88	6.4	
CS	87.75	37.38	CABLETRON SYSTEMS	71.88	-0.63	-0.9	
CSCC	92.50	29.25	CASCADE COMMUNICATIONS	79.00	6.81	9.4	
CLD	11.38	6.00	COMPRESSION LABS INC.	6.94	0.06	0.9	
CSGO	89.38	32.38	CISCO SYSTEMS INC.	74.88	4.25	6.0	
CMNT	12.25	4.00	COMPUTER NETWORK TECH.	5.00	0.13	2.6	
XCOM	14.50	8.75	CROSSCOMM INC.	10.63	0.00	0.0	
CCS	14.00	21.88	CCS COMMUNICATIONS (L)	26.38	-1.44	-3.2	
FOR	67.75	25.50	FORE SYSTEMS INC.	57.25	3.25	6.0	
GC	35.88	9.25	GENERAL DATACOM INC.	11.88	-1.38	-10.4	
GSI	42.50	28.00	GENERAL SIGNAL NETWORKS	32.88	0.00	0.0	
GTE	46.50	30.88	GTE CORP. (H)	45.00	0.25	0.6	
MIC	27.88	17.38	MCI COMMUNICATIONS CORP. (H)	27.88	1.13	4.2	
NET	12.25	5.50	NETSCAPE COMMUNICATIONS CORP.	7.25	-0.13	-1.0	
MMPI	28.00	9.00	MICROMIN INC.	23.00	2.13	10.2	
NETM	34.00	10.00	NETMANAGE INC. (L)	11.88	1.00	9.2	
NETR	10.13	3.63	NETRIS CORP.	3.88	-0.50	-11.4	
NCDI	12.00	4.00	NETWORK COMPUTING DEVICES	6.50	0.88	15.6	
NWK	42.00	19.75	NETWORK EQUIPMENT TECH.	25.50	1.00	4.1	
NETG	46.50	22.75	NETWORK GENERAL	31.50	-1.00	-3.2	
NWTH	42.19	7.38	NET WORTH INC.	42.13	0.00	0.0	
NN	49.13	25.00	NETWORLD NETWORKS CORP. (H)	49.13	2.50	5.4	
NOV	23.25	13.63	NORTHERN TELECOM.	44.00	1.75	4.1	
NYN	54.00	36.00	NYNEX CORP.	52.63	2.25	4.5	
QDI	42.63	18.00	QDI COMMUNICATIONS CORP.	33.50	5.75	10.2	
QDS	43.25	12.75	OPTICAL DATA SYSTEMS INC.	19.75	-1.50	-7.1	
PTCL	43.88	11.50	PICTURETECH INC.	38.88	3.38	9.5	
PTOT	10.75	5.00	PROTECH INC.	6.50	0.25	4.5	
RACO	7.88	3.13	RACOTEC INC.	5.13	0.75	17.1	
RETA	5.50	1.81	RETECH INC.	2.06	-0.10	-5.9	
ATX	44.88	11.38	SCIENTIFIC ATLANTA INC.	14.00	0.13	0.9	
SHV	77.50	27.00	SHIVA CORP.	66.00	2.88	4.6	
SBC	60.25	39.63	SHAW-WESTERN BELL CORP.	55.38	-0.38	-0.7	
SPR	51.00	27.13	SPRINT CORP.	45.50	2.13	5.4	
SMSC	31.63	12.50	STANDARD MICROSYSTEMS CORP.	27.13	-0.88	-4.7	
STN	82.00	32.00	STANLEY ELECTRONICS	75.00	5.75	7.0	
TBIT	8.63	2.38	TELEBIT CORP.	4.25	-1.25	-29.2	
USRI	110.50	23.13	US ROBOTICS	89.00	13.56	18.0	
USW	48.38	28.38	US WEST INC.	34.63	0.13	0.4	
XIRC	10.00	8.88	XIRCOM	10.75	0.00	0.0	
ALXG	78.00	15.50	XILINK INC.	58.75	0.00	0.0	
PC and Notebook Computers				PC and Notebook Computers			
AALR	9.63	4.13	ADVANCED LOGIC RESEARCH	6.88	0.38	5.8	
APLI	50.13	29.50	APPLE COMPUTER INC.	29.50	-4.13	-12.3	
ASTA	19.13	7.50	AST RESEARCH INC.	8.75	0.00	0.0	
CPQ	87.75	31.13	COMPAQ COMPUTER CORP.	82.00	1.00	2.2	
DELL	49.38	19.75	DELL COMPUTER CORP.	26.63	-2.00	-7.0	
GATE	37.50	16.00	GATEWAY 2000 INC.	20.38	-2.25	-12.2	
HWE	26.63	5.00	HONEYWELL INFORMATION	78.75	0.38	0.5	
MUPY	29.88	8.75	MICRON INTERNATIONAL INC.	9.63	-0.88	-8.3	
NIPRI	75.13	45.13	NEC AMERICA	61.50	1.25	2.1	
SGI	51.50	21.50	SGS THOMSON MICROELECTRONICS	27.00	3.00	12.5	
SUNW	51.50	15.00	SUN MICROSYSTEMS INC.	46.75	6.63	16.5	
Large Systems				Large Systems			
AMH	13.63	7.69	ANDALCO CORP.	7.75	-0.13	-1.6	
CNI	8.13	3.63	CONVEY COMPUTER	4.00	0.00	0.0	
CRN	29.25	14.63	CRAY RESEARCH INC.	25.63	1.38	5.7	
DGN	14.75	6.75	DATA GENERAL CORP.	12.75	0.50	4.1	
DEC	66.75	31.13	DIGITAL EQUIPMENT CORP.	61.75	7.88	13.0	
IBM	114.63	70.25	IBM	103.75	17.38	20.1	
MDCD	12.75	3.00	MEDIAN DATA INC.	10.25	0.50	5.1	
NET	11.75	4.25	NETFRAME INC.	6.00	1.13	23.0	
SECT	25.38	12.25	SEQUENT COMPUTER SYS. (L)	14.25	1.50	11.8	
SIQ	10.00	3.50	SIQUINT SYSTEMS INC.	5.13	0.13	2.5	
SRA	39.88	23.00	STRATUS COMPUTER INC.	30.00	-2.13	-6.6	
TDI	19.75	9.75	TANDY COMPUTERS INC.	9.88	-0.50	-4.8	
TRCD	6.25	2.50	TRICOM SYSTEMS	3.00	0.19	6.7	
US	13.63	5.50	UNISYS CORP.	6.88	-0.13	-1.8	
Software				Software			
ADBE	74.25	28.50	ADOBE SYSTEMS INC.	37.38	-2.50	-6.3	
ANWS	8.75	2.75	AMERICAN SOFTWARE INC.	5.00	-0.63	-11.1	
APLX	29.00	6.00	APPLIX INC.	23.00	-0.75	-3.1	
ARSW	48.50	29.88	ARCON SOFTWARE	31.75	-0.25	-0.8	
ACAD	53.00	27.25	AUTODESK INC. (L)	30.00	0.50	1.7	
BACH	10.75	3.63	BACHMAN INT'L SYSTEMS	9.38	0.13	1.4	
BGSS	42.00	24.25	BGS SYSTEMS INC.	35.25	0.25	0.7	
BMCS	51.50	27.50	BMC SOFTWARE INC.	42.00	2.50	6.3	
BOUL	26.38	17.13	BOULE AND BARBAGE	20.13	-1.38	-6.4	
BOYL	20.63	6.50	BORLAND INT'L INC.	16.75	3.13	22.9	
CESH	3.94	1.38	CES SOFTWARE	2.75	0.00	0.0	
CYR	27.88	12.38	CYBERVIEW SOFTWARE INC.	22.50	-1.50	-6.3	
COGN	45.16	16.00	COGNOS INC.	38.88	0.38	1.0	
CA	70.50	33.13	COMPUTER ASSOCIATES	62.75	7.00	12.6	
CVN	15.50	4.38	COMPUTATION CORP.	13.75	1.63	13.4	
CPWR	43.00	15.50	COMPUWARE CORP.	37.13	0.38	2.2	
CSRE	27.75	9.13	COMSHARE INC.	22.25	0.00	0.0	
COSF	19.50	8.38	CORP. CORP. (L)	10.00	-0.50	-4.8	
DWTI	16.25	6.50	DATAWARE TECHNOLOGIES INC. (L)	6.50	-1.25	-16.1	
DISG	32.25	14.13	DISCREET LOGIC INC.	24.00	1.13	5.0	
FILE	51.00	27.25	FILENET CORP.	49.75	1.50	3.1	
DDDD	8.25	3.38	4TH DIMENSION	4.38	-0.25	-5.4	
FTPS	40.63	11.00	FTP SOFTWARE INC.	31.00	-0.50	-1.6	
GSO	26.00	7.50	GROUP I SOFTWARE	8.50	1.00	13.3	
GITA	13.38	4.88	GUSTO	5.63	-0.13	-2.2	
HOGN	13.88	1.63	HOGAN SYSTEMS INC.	11.00	-0.13	-1.0	
HYSP	28.38	15.63	HYPERION SOFTWARE CORP.	20.00	-2.75	-12.1	
IRK	18.63	10.00	INFORMATION RESOURCES	14.63	1.13	8.3	
IRMX	34.38	14.88	INFORMIX CORP.	30.75	2.00	7.0	
INGR	18.50	8.63	INTERGRAPH CORP.	17.69	0.44	2.5	
LEAF	12.63	5.00	INTERLEAF INC.	6.63	-0.75	-10.2	
ISL	26.25	11.75	INTERSOFT INC.	10.25	-0.38	-3.5	
INTU	89.25	29.63	INTUIT INC.	53.13	-12.38	-18.9	
MGCF	11.50	3.63	MICRO SOFTWARE ENTERPRISES	9.13	0.56	6.6	
MANU	20.50	8.50	MANUFACTURING GROUP INC.	11.13	-0.13	-1.1	
MAPS	40.00	10.00	MAPINFO CORP.	12.38	-0.63	-4.8	
Services				Services			
AMSY	21.63	11.13	AMERICAN MGMT. SYSTEMS	21.63	2.25	11.6	
ANLY	33.00	19.81	ANALYSTS INT'L	27.75	-0.75	-2.6	
AUD	41.25	29.25	AUTO DATA PROCESSING	37.13	0.25	0.6	
CATP	61.00	22.50	CAMBRIDGE TECH. PARTNERS	52.00	4.50	9.5	
CHN	47.50	26.88	CERIDIAN CORP.	39.00	0.88	2.3	
CDI	23.75	15.25	COMDISCO INC.	21.50	0.25	1.2	
CHZ	26.75	6.38	COMPUTER HORIZONS	22.13	-1.88	-7.8	
CSK	75.38	46.50	COMPUTER SCIENCES	75.38	7.13	10.4	
COM	1.00	1.00	COMPUTER TASK GROUP	0.50	-0.13	-1.1	
CPU	44.38	16.75	COMPUSET INC.	28.50	0.00	0.0	
CDAT	21.38	5.88	CONTROL DATA SYSTEMS INC.	15.13	-0.88	-5.4	
EQIC	24.50	2.13	EGENEA DISCOUNT SOFTWARE (L)	5.00	-0.25	-5.0	
GEOS	57.38	36.88	GENERAL MOTORS (E) (S)	54.38	2.75	5.3	
INEL	15.25	7.63	INACOM CORP.	14.75	0.75	5.4	
INTE	14.63	1.63	INTELLIGENT ELECTRONICS (L)	11.63	-0.63	-5.0	
INSE	18.50	3.88	INTEGRIS	3.88	-1.50	-27.9	
IRMA	15.00	7.25	MICROIMAGE INC.	7.75	-0.38	-4.6	
PATX	51.38	25.88	PAYCHEX INC.	47.13	2.75	5.4	
PKMS	54.25	40.75	POLY MANAGEMENT SYS.	43.63	-2.88	-6.2	
REY	39.63	23.13	REYNOLDS AND REYNOLDS	21.75	-0.25	-1.2	
SHR	52.63	32.00	SHARED MEDIA SYSTEMS	36.25	6.13	12.2	
SP	49.38	15.63	SPECTRA SOFTWARE INC.	39.38	0.56	1.4	
SMPE	26.50	14.88	SPECTRUM SPECTRUM INC.	18.25	-1.25	-6.4	
SNOT	32.50	17.75	SUNGARD DATA SYSTEMS	28.25	-0.50	-1.8	
OFFSHORE				OFFSHORE			
AMER	66.25	13.25	AMERICA ON-LINE	35.25	-1.25	-3.6	
NETC	95.50	19.00	NETCOM ON-LINE	72.75	-1.25	-1.6	
NSCP	174.00	3.75	NETSCAPE COMM. CORP.	143.50	6.25	4.6	
QTRC	39.50	3.03	QUARTERCOM CORP.	16.63	-3.38	-16.9	
SPR	11.50	1.00	SATURN SYSTEMS INC. (L)	11.50	0.00	0.0	
UNLT	98.75	21.50	UNILET TECH.	49.25	1.25	2.6	
OFFSHORE				OFFSHORE			
AMER	66.25	13.25	AMERICA ON-LINE	35.25	-1.25	-3.6	
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NETC	95.50	19.00	NETCOM ON-LINE	72.75	-1.25		

Citibank cashes in

CONTINUED FROM COVER 1

boygan to Shanghai. Each Citibank business unit and department had been empowered to make its own information technology architecture decisions.

Now corporate IS will make those decisions, but each unit will implement its own systems.

"If we didn't get that under control, the costs to operate and support that infrastructure would have escalated beyond reach," Singh said.

Citibank, based in New York, spends an estimated \$400 a month to support each of its 60,000 desktop systems — or \$24 million a month.

Citibank expects to reduce those bills significantly by scaling back the number of systems and licenses it has to support. Singh declined to speculate on actual cost savings, however.

IT never sleeps

Citibank is in the process of standardizing the following LAN, desktop and server technologies in 93 countries

- 2,000 Novell NetWare LANs
- 60,000 Intel PCs and workstations
- Desktop application suite — Microsoft's Office
- Desktop and server operating system — Microsoft's Windows NT

Analysts applauded Citibank's plans. "They're in an exceptional position since they're in more local markets than any bank in the world," said Laura Stuart, president of Stuart Research, a Cambridge, Mass.-based banking consultancy. The bank should be able to save millions of dollars in support costs by not having to manage a worldwide matrix of incompatible systems, she said.

Since it began installing new equipment last year, Citibank has upgraded approximately one-third of its 60,000 desktops to Intel Corp.-compatible hardware. More than 90% of its 2,000 LANs have been transitioned to NetWare, with most of them upgraded to NetWare Version 4.1.

Perhaps more importantly, Citibank now has about half its desktop-to-LAN assets under control, Singh said. Citibank expects to complete the technology rollout by the end of 1998.

Freightliner moves an NT-based application to its dealers. See page 59.

Beta users are bullish on Microsoft's Web software

Internet Information Server to ship next month

By Laura DiDio

Initial reports from beta users of Microsoft Corp.'s Internet Information Server are upbeat enough that the company has moved up its ship date by a few weeks.

Microsoft says it will deliver the Internet server software for the World Wide Web in the latest edition of its Windows NT Server Network Value Pack, due next month.

Microsoft's Internet Information Server (IIS) — originally code-named Gibraltar — will allow businesses to exchange electronic mail and distribute information. That distribution can take place over internal company intranets or across the global Internet using the underlying Windows NT Server network operating system.

IIS will be bundled in Microsoft's revised Windows NT Server Network Value Pack. Currently, it runs only on the Windows NT Server platform. However, it was designed to interoperate with any Web client, such as Netscape Communication Corp.'s Navigator, using any desktop client, said Mike Nash, Microsoft's group manager for NT Server.

Security a winner

Beta users and analysts said IIS is robust and relatively easy to use. Greg Pulier, head programmer at Digital Evolution, Inc. in Los Angeles, said he was most impressed with the product's security. It borrows from the underlying NT Server architecture and the Web's tight linkage with the SQL Server database. That has proved to be "a big time-saver,"

Pulier said.

Lyle Anderson, chief information officer at Harper Collins Publishers, Inc. in New York, has had the IIS pilot up and running for the past month.

"The integration between IIS and

pressure on current Internet Web server providers like Netscape, O'Reilly and Process Software in a difficult position because Microsoft is bundling IIS into Windows NT Server free of charge. And if it costs nothing, how can the competition beat that?" he asked.

Gould, an IIS beta user himself, said the server lacks some of the more cutting-edge features. Those include advanced remote administration and any applications for monitoring statistics and Web server events of its more mature rivals.

Despite this, beta testers such as Mark Avnet are impressed. Avnet is director of new media at Radical Media, Inc., a commercial advertising production firm in New York.

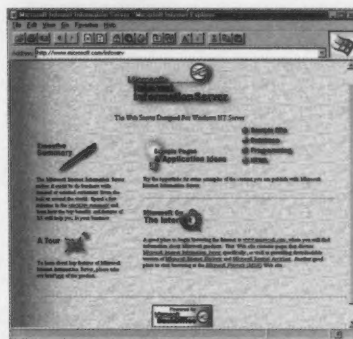
"Sure it's missing a few things. IIS doesn't specifically support Netscape tags and plug-in technology, but the Microsoft software is good now, and it's going to get a lot better," he said.

Other beta testers noted that IIS comes equipped with some necessary and basic facilities that are helpful.

"That's why we're going to dump the Netscape Commerce Server as soon as Microsoft's IIS goes gold," said Richard Warren, director of information services at Judd's, Inc., a printing company in Strasburg, Va.

Greg Sands, a Netscape product marketing manager, explained that the Netscape Commerce Server does have an automatic reboot facility, but to make it work, the user must turn off the security features. "So there are trade-offs involved," Sands said.

Microsoft has an Internet strategy for the Mac, too. See page 54.



Microsoft's Internet Information Server will let businesses exchange E-mail and distribute information via the Internet and intranets

SQL Server has made it easy for us to build MIS database applications, and it solves the problem of software distribution," Anderson said. Instead of sending out time-consuming software updates, the company can now do that over its own Web site, he added.

Michael Gould, an analyst at Patricia Seybold Group in Boston, said the initial IIS software isn't as significant as the long-term strategy it represents.

Microsoft is throwing down the gauntlet and is "serving notice to the other Web server suppliers that they have arrived on the Internet scene in a big way," Gould said.

"This is going to put tremendous

pressure on current Internet Web server providers like Netscape, O'Reilly and Process Software in a difficult position because Microsoft is bundling IIS into Windows NT Server free of charge. And if it costs nothing, how can the competition beat that?" he asked.

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Cabletron

CONTINUED FROM COVER 1

technology is far less expensive, markedly more mature and more broadly offered than ATM," said Daniel Briere, president of TeleChoice, Inc., a consultancy in Verona, N.J.

Briere noted that Cabletron rivals Bay Networks, Inc., 3Com Corp. and Cisco Systems, Inc. are already in the Fast Ethernet market.

It would cost about \$400 to \$500 per user to implement the latest

100M bit/sec. Fast Ethernet wares, while ATM, at 25M bit/sec., costs roughly \$800 to \$1,200 per user. That includes a switch port and an adapter card.

The customer angle

"We'd be interested in Fast Ethernet uplinks if the price is right, but we already have FDDI and Token Ring backbones," said Bob Currier, director of network communications at Duke University in Durham, N.C. He runs a network of Cabletron Multimedia Access Center (MMAC) and MMAC-Plus switching hubs that supports more than 15,000 end users.

"Cabletron saw a big push from its user base for Fast Ethernet technology and found that their

internal development efforts weren't going to meet near-term needs," said Skip MacAskill, a senior research analyst at Gartner Group, Inc. in Stamford, Conn. "They miscalculated the timing for the emergence of Fast Ethernet and bought into SMC, which was a very wise move."

One user agreed. "Cabletron is definitely moving in the right direction with Fast Ethernet technology," said Steve Olynik, a network analyst at Avid Technol-

On tap

Other new products from Cabletron will include the following:

- Fast Ethernet uplinks for existing and planned switching systems.
- Stackable Fast Ethernet hubs.
- Fast Ethernet repeaters.
- Fast Ethernet adapter cards.

the street.

The FastNet 10 was designed to compete with 3Com's LinkS-

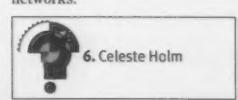
ologies, Inc. in Tewksbury, Mass. "We need to have the flexibility to support workgroups regardless of location in our buildings, and Fast Ethernet uplinks would be their connection to our backbone network."

Sources said Cabletron will advertise a \$500-per-port list price for its FastNet 10 model, but the switch will likely sell for much less on

with 1000, which costs about \$200 per port and has 24 switched Ethernet ports and a Fast Ethernet uplink.

Cabletron's other major product, the FastNet 100, will have a new feature called port trunking, sources said. This will let users link FastNet switches together, using four ports from each switch, to form a 400M bit/sec. connection.

Today, users have to choose either 100M bit/sec. or 200M bit/sec. pipes for their inter-switch networks.



6. Celeste Holm

Take a Closer Look at switching. See page 47.

The Back Page

2nd Amdahl preaches 'a better way'

Charles Babcock

Carlton Amdahl has something in common with PC users these days. He's completely frustrated with the many petty barriers to plugging in an Intel-based server and finding out that somewhere between the hardware and a device he needs to use is a bit of microcode or an interface that erects an incompatibility barrier.

Amdahl has stepped down as chairman of NetFrame Systems, Inc., the Milpitas, Calif., maker of component servers. And from his remarks at a recent Server I/O Conference luncheon, it's clear he'd like to advocate a standard I/O specification for Intel-based servers as one way to put servers such as NetFrame's on a more competitive footing.

Amdahl, who was also chief technology officer of NetFrame, was the author of several novel ideas on building scalable, low-cost servers out of Intel microprocessors, including the following:

- He designed servers with redundant buses and I/O channels. Borrowing from the mainframe world, he put intelligence on the channels to off-load from the CPU

the task of managing I/O traffic and providing error checking and correction.

- He designed a software layer called Concerto that neutralized the differences between the operating system and the drivers for peripherals attached to the server. Instead of being hard-wired to a disk drive, a CPU was connected by a neutral messaging layer that could activate the correct device drivers.

But NetFrame was able to capitalize on these ideas only up to a point. Since its founding in 1987, it has grown to 300 employees and sold \$400 million worth of servers. But this isn't enough business to power NetFrame onto the next level of superserver design.

Indeed, Amdahl clearly believes change must come to the industry before his ideas will get a broader stage. As the son of Gene Amdahl, one of the original System 360 architecture designers and founder of Amdahl Corp., Carl is the second generation to

step forward and say, "We can do better."

The server environment "needs a model that looks more like a peer-to-peer network," Amdahl said. Under such a model, when a device is plugged in, "it broadcasts its presence, is recognized by the operating system and bound to associated devices."

This is plug and play on a much grander scale than we have dreamed before, but why not?

"If the device can't work with a given version of the operating system, then the operating system would ratchet it down to a lower level" that would enable it to fit in to the existing environment, Amdahl said. This way, all devices on the network could be used and re-

used, depending on current needs and the status of operations.

Contrary to such a vision, today's components, coming from many different vendors, "appear to work together but often don't. Your operating system is Version

1.6, and your SCSI device card works with Version 1.5, leading to an unforeseen stall point," Amdahl noted. And it is the customer who "ultimately becomes the testing point," he said.

Amdahl called for defining more rigorously the interfaces between systems.

"We have to stop believing in a zero-sum game," where profit is associated with small, proprietary barriers that keep out competitors. Believe instead, he said, in the capacity of users to keep expanding their use of technology, provided they can make things work together.

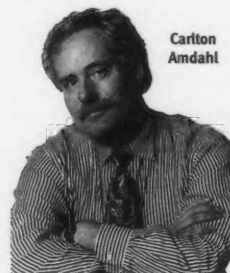
It is probably frustration with the unlikelihood of NetFrame's ever playing on that kind of open field that prompted Amdahl to step down and pursue a different tack. He hinted that a consortium or public interest group is about to emerge to advocate an open approach to server I/O clustering.

Such a step could provide a sudden push against the boundaries of computing. Or at least Carl Amdahl appears ready to make the case that it's a better way to do things than the mish-mash of incompatibilities that has come about so far.

Babcock is *Computerworld's* technical editor. His Internet address is charles_babcock@cw.com.



This is plug and play on a much grander scale than we have dreamed before, but why not?



Carlton Amdahl

Inside Lines

Delays not tolerated

Facing a delay in rolling out its frame-to-cell service interworking, AT&T reached out beyond StrataCom, its faithful and sole outside switch provider, to Cascade Communications. Analysts said the deal was a wise move that is likely to cost AT&T an additional \$1 million to roll out the service, which lets firms build hybrid ATM/frame-relay networks. "StrataCom didn't have the software ready," an AT&T spokeswoman said. "And the work-around they proposed was not production quality." A StrataCom spokesman claimed the company "provided the software when we said we'd provide it." LDDS/WorldCom is expected to announce this week that it will support the service from its Cascade switches, not its StrataCom switches.

Cyberobliterated

The Web site of Vermeer Technologies, a Web development company that Microsoft bought lock, stock and employees last week, was wiped out after the Big M announced its acquisition last Tuesday. Vermeer's home page, at <http://www.vermeer.com/>, was replaced with a Microsoft-written press release that announced the deal. All hot links on the page led surfers back to Microsoft.

Maybe it would work in your town

A document imaging and retrieval project in the Flagstaff, Ariz., city clerk's office captured more than City Council meeting minutes. The recently completed project, begun in 1993 and based on an archive and search system developed by Compulink Management Center, brought history to life from crumbling documents dating

back to 1894. Among the discoveries: The City Council passed a resolution in 1906 formally declaring the police chief insane and ordering him to leave town.

Everyone's a webhead

Sheldon Laube, one of the bouncing balls of the computer industry, has left his latest post as chief technology officer at Novell. The cheery New Yorker will take the same reins at U.S. Web, an Internet software start-up, according to a source close to U.S. Web. The source said

U.S. Web is expected within the next 45 days to disclose a business plan that includes Web development tools.

Switch me on

3Com will soon announce Fast Ethernet modules for its LANplex 6000 and LANplex 2000 switching hubs. 3Com will announce at the ComNet '96 conference a series of ATM products, including new members of its Cellplex switching hub family, and will detail plans for ATM products gained through its merger with Chipcom.

Warp speed, Mr. Sulu

Cyrix is gearing up to announce three new speeds for its 6x86 line of Pentium clones the week of Feb. 5. According to a source close to the Richardson, Texas, company, Cyrix will announce 110-, 120- and 133-MHz versions of the sixth-generation chip. Despite the lower clock speeds, the chips will be directly comparable to the performance of Intel's 133-, 150- and 166-MHz Pentium chips, the source claimed.

And you thought you'd heard stupid before. . . . Ask the people at UltraNet Communications, a Marlboro, Mass.-based Internet access service. They are finding that the mass media buzz about the Web has got some former technophobes diving into the pool, and customer service is now its biggest challenge. Consider this: A new user called up to complain that his trip to cyberspace was going nowhere. His problem? He failed to realize his PC mouse was not a foot pedal. To get in touch with Computerworld about news items or tips, call our 24-hour voice-mail tip line at (508) 820-8555 or our toll-free number at (800) 343-6474. News editor Maryfran Johnson can be reached by phone at (508) 820-8179 or via the Internet at maryfran_johnson@cu.com.



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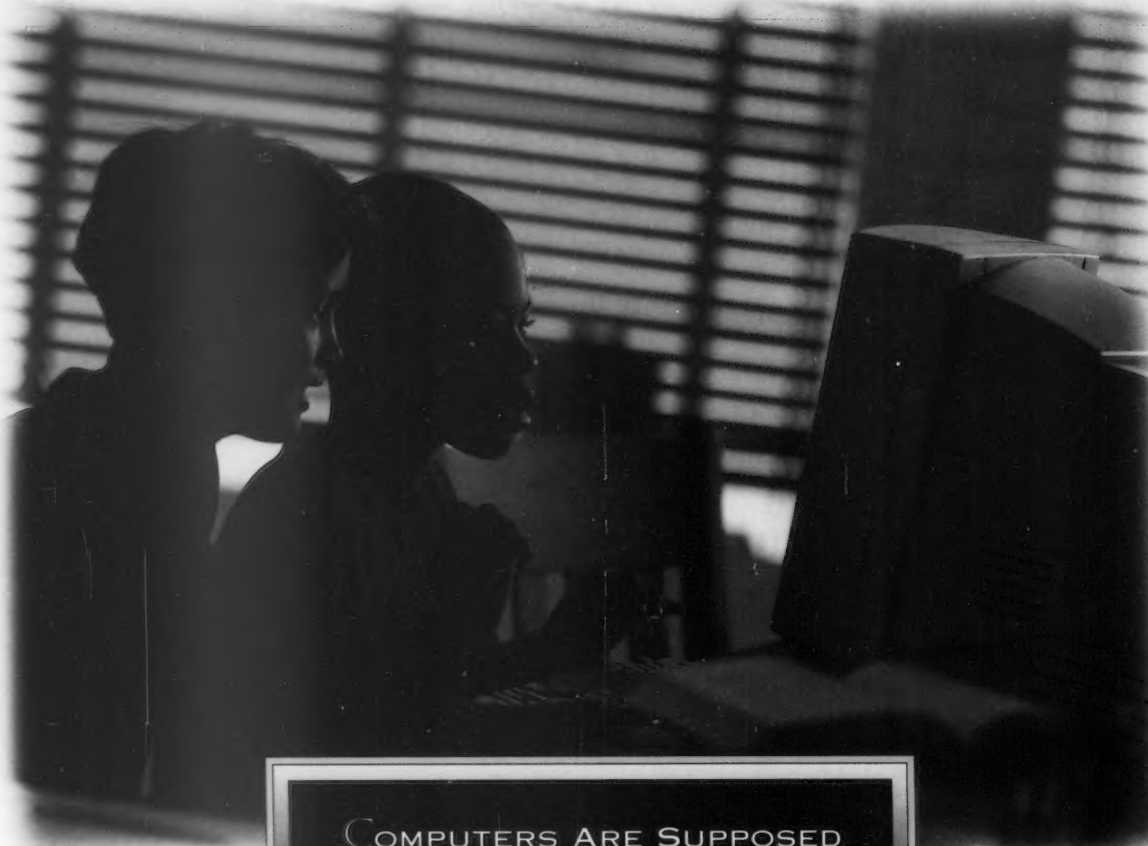
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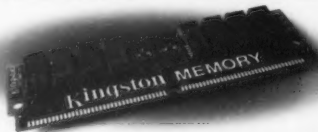
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